

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
Occupant Protection In Interior Impact
Upper Interior Head Impact Protection**

**HYUNDAI MOTOR COMPANY
2006 Hyundai Accent 4-Door Sedan
NHTSA No. C60508**

**MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083**



Test Dates: July 12-13, 2006
Report Date: September 12, 2006

FINAL REPORT

PREPARED FOR:

**U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
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16. Abstract A compliance test series was conducted on the subject 2006 Hyundai Accent, 4-Door Sedan, NHTSA No. C60508, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-201U-01 for the determination of FMVSS 201 compliance. The testing was conducted at MGA Research Corporation in Troy, Michigan on July 12-13, 2006. Test failures identified were as follows: None The data recorded indicates that the 2006 Hyundai Accent, 4-Door Sedan, tested appears to comply with the upper interior requirements of FMVSS 201.			
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SECTION 1.0
PURPOSE OF
COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2006 Hyundai Accent, 4-Door Sedan, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted during July 12-13, 2006 on a 2006 Hyundai Accent, 4-Door Sedan, manufactured by Hyundai Motor Company.

All tests were conducted in accordance with the U. S. Department of Transportation, National Highway Traffic Safety Administration's Laboratory Test Procedure TP-201U-01 dated April 3, 1998 and the corresponding MGA Research Corporation's FMVSS 201U procedure number MGATP201U_FRAME#2 dated July 1, 2005.

All tests were conducted at MGA Research Corporation in Troy, Michigan and were performed by MGA engineers and technicians. The FMVSS 201U impactor test machine was used to conduct the testing. Target locations were determined by using a Coordinate Measurement Machine in conjunction with the MGA EZ-Target™ program and MGA procedure MGATP201U_Test Series dated July 1, 2005.

2.0 COMPLIANCE TEST DATA SUMMARY

The 2006 Hyundai Accent, 4-Door Sedan, was equipped with A, B, and rear-pillars, an adjustable seat belt anchorage on each B-Pillar, a grab handle located on the side rail above the front passenger door and both rear doors, and a light console in the center of the upper roof.

Upon completion of targeting the test vehicle, twelve (12) targets were chosen to be impacted based upon engineering judgment and certification test data provided by Hyundai. The twelve (12) targets chosen were:

AP1	BP1	BP4	UR (RC)
AP2	BP2	UR (BP1)	UR (SR1)
AP3	BP3	UR (FC)	UR (SR2-A)

The 2006 Hyundai Accent, 4-Door Sedan, tested appears to comply with the upper interior performance criteria for FMVSS 201. The HIC(d) measured using the Part 572L (Free Motion Headform) was below 1000 for each tested component.

TABLE 2-1
SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door Sedan

VEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: Beige

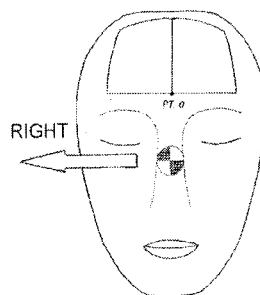
VEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

TARGET	VEHICLE SIDE	HORIZONTAL ANGLE (deg)	VERTICAL ANGLE (deg)	VELOCITY (kph)	HIC(d)	FMH HIC	IMPACT ON FMH (mm)	
							Above	Left/Right
AP1	Right	125	23	19.2	304	182	25	12 Right
AP2	Left	201	50	19.4	355	250	10	10 Right
AP3	Right	158	45	19.8	340	230	17	3 Left
BP1	Left	270	12	18.9	454	381	50	0
BP2	Left	270	8	24.6	552	511	16	5 Left
BP3	Right	90	-1	23.4	796	835	27	11 Right
BP4	Right	158	-5	23.8	496	437	17	0
UR5 (BP1)	Right	90	40	24.2	896	967	45	10 Left
UR1 (FC)	Left	270	50	25.1	775	806	27	3 Right
UR3 (RC)	Left	270	47	24.0	718	731	25	9 Left
UR4 (SR1)	Right	90	50	24.8	641	629	15	22 Left
UR2 (SR2A)	Left	270	44	24.1	939	1023	37	0

Above and left/right refers to the position relative to reference pt. 0 where the target made contact with the Free Motion Headform. See the diagram below for details.



POST TEST COMMENTS:

The following description lists any post-test damage or other test observations for each target.

AP2 Left: A-Pillar cracked and dislodged.

AP3 Right: A-Pillar cracked.

BP1 Left: Cover dislodged.

BP4 Right: B-Pillar creased.

UR4 Right: Headliner displacement.

UR5 Right: Headliner displacement.

REMARKS:

The targets listed were impacted in the following order:

Left: AP2, UR1 (FC), UR2 (SR2A), BP2, BP1, UR3 (RC)

Right: AP3, AP1, UR4 (SR1), BP3, BP4, UR5 (BP1)

The 150 mm rule was observed for targets horizontal to each other and the 200 mm rule was observed for vertical components.

RECORDED BY: Matt Kerr

DATE: July 13, 2006

APPROVED BY: Helen A. Kalet

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door Sedan

VEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: Beige

VEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

INTERIOR TRIM INFORMATION: A, B, and rear-pillars, an adjustable seat belt anchorage on each B-Pillar, a grab handle located on the side rail above the front passenger door and both rear doors, and a light console in the center of the upper roof.

SUNROOF INFORMATION:

Installed: Yes X No

Operation: Electric Manual

SIDE RAIL CURTAIN AIRBAG INFORMATION:

Installed: X Yes No

ROLL-BAR INFORMATION:

Installed: Yes X No

Padded: Yes X No

Braces: Yes X No

GENERAL INFORMATION:

Date Received: February 20, 2006; Odometer Reading: 6 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Hyundai Motor Company

Date of Manufacture: 12/8/05; VIN: KMHCHN46C46U016321

GVWR: 1650 kg; GAWR FRONT: 870 kg;

GAWR REAR: 850 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 210 kpa REAR: 210 kpaRecommended Tire Size: P185/65R14

Recommended Cold Tire Pressure:

FRONT: 210 kpa REAR: 210 kpaSize of Tire on Test Vehicle: P185/65R14Type of Spare Tire: T115/70D15 Saver: X; Standard:

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench ; Bucket X; Split Bench Number of Occupants: Front 2; Rear 3; TOTAL 5

VEHICLE CAPACITY WEIGHT:

Vehicle Capacity Weight (VCW) = 385 kgNo. of Occupants x 68 kg = 340 kgRated Cargo/Luggage Weight (RCLW) = 45 kg (difference)

WEIGHT OF TEST VEHICLE AS DELIVERED AT LABORATORY: (with maximum fluids)

Right Front = 356.0 kg Right Rear = 210.5 kgLeft Front = 356.5 kg Left Rear = 230.0 kgTOTAL FRONT = 712.5 kg TOTAL REAR = 440.5 kg% Total Weight = 61.8 % % Total Weight = 38.2 %TOTAL DELIVERED WEIGHT = 1153.0 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1153.0 kgMax. Test Cargo/Luggage Weight = 45.0 kgTarget Test Weight = 1198.0 kg

WEIGHT OF TEST VEHICLE FULLY LOADED:

Right Front =	<u>349.5</u> kg	Right Rear =	<u>240.0</u> kg
Left Front =	<u>355.5</u> kg	Left Rear =	<u>254.5</u> kg
TOTAL FRONT =	<u>705.0</u> kg	TOTAL REAR =	<u>494.5</u> kg
% Total Weight =	<u>58.8</u> %	% Total Weight =	<u>41.2</u> %
TOTAL TEST WEIGHT = <u>1199.5</u>			
Weight of ballast secured in vehicle's cargo area = <u>46.5</u>			

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 668 mm; Left Front 656 mm;
 Right Rear 668 mm; Left Rear 661 mm;
 Pitch Angle at Right Door Sill = 0.6 Rear higher
 Pitch Angle at Left Door Sill = 0.7 Rear higher
 Roll Angle at Front Bumper = 0.2 Left side higher
 Roll Angle at Rear Bumper = 0.4 Left side higher

FULLY LOADED: Right Front 669 mm; Left Front 657 mm;
 Right Rear 654 mm; Left Rear 648 mm;
 Pitch Angle at Right Door Sill = 0.2 Rear higher
 Pitch Angle at Left Door Sill = 0.4 Rear higher
 Roll Angle at Front Bumper = 0.2 Left side higher
 Roll Angle at Rear Bumper = 0.4 Left side higher

AS TARGETED: Right Front 846 mm; Left Front 838 mm;
 Right Rear 835 mm; Left Rear 829 mm;
 Pitch Angle at Right Door Sill = 0.4 Rear higher
 Pitch Angle at Left Door Sill = 0.5 Rear higher
 Roll Angle at Front Bumper = 0.2 Left side higher
 Roll Angle at Rear Bumper = 0.4 Left side higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill = 0.3 Rear higher
Pitch Angle at Left Door Sill = 0.5 Rear higher
Roll Angle at Front Bumper = 0.2 Left-side higher
Roll Angle at Rear Bumper = 0.3 Left-side higher

AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill = 0.4 Rear higher
Pitch Angle at Left Door Sill = 0.5 Rear higher
Roll Angle at Front Bumper = 0.2 Left side higher
Roll Angle at Rear Bumper = 0.4 Left side higher

VEHICLE WHEELBASE = 2500 mm

REMARKS: The seat travel distance was measured to be 220 mm for the driver front seat and 220 mm for the passenger front seat.

RECORDED BY: Matt Kerr

DATE: July 7, 2006

APPROVED BY: Helen A. Kalet

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door SedanVEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: BeigeVEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006TEST LABORATORY: MGA Research CorporationOBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

	HORIZONTAL ANGLE SPECIFIED RANGE	MINIMUM HORIZONTAL ANGLE	MAXIMUM HORIZONTAL ANGLE
A-PILLAR	L 195°-255°	L 199.4°	L 246.6°
	R 105°-165°	R 114.4°	R 159.2°
B-PILLAR	L 195°-345°	L 201.6°	L 273.5°
	R 15°-165°	R 82.5°	R 158.1°

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: Matt KerrDATE: July 7, 2006APPROVED BY: Helen A. Kaleto

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door Sedan

VEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: Beige

VEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

VERTICAL IMPACT ANGLE RANGES

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
FRONT HEADER	FH1	L 0°-50°	L 0°	L 50°
		R 0°-50°	R 0°	R 50°
	FH2	L 0°-50°	L 0°	L 50°
		R 0°-50°	R 0°	R 50°
SIDE RAIL	SR1	L 0°-50°	L 0°	L 9°
		R 0°-50°	R 0°	R 40°
	SR2A	L 0°-50°	L 0°	L 29°
		R 0°-50°	R 0°	R 43°
	SR2B	L 0°-50°	L 0°	L 9°
		R 0°-50°	R 0°	R 33°
	SR3-1	L 0°-50°	L 0°	L 42°
		R 0°-50°	R 0°	R 43°
	SR3-2	L 0°-50°	L 0°	L 39°
		R 0°-50°	R 0°	R 39°
REAR HEADER	RH	L 0°-50°	L 0°	L 50°
		R 0°-50°	R 0°	R 50°
A-PILLAR	AP1	L -5°-50°	L -5°	L 23°
		R -5°-50°	R -5°	R 23°

		VERTICAL ANGLE SPECIFIED RANGE		MINIMUM VERTICAL ANGLE		MAXIMUM VERTICAL ANGLE	
A-PILLAR	AP2	L	-5°-50°	L	-5°	L	50°
		R	-5°-50°	R	-5°	R	50°
	AP3	L	-5°-50°	L	-5°	L	43°
		R	-5°-50°	R	-5°	R	45°
B-PILLAR	BP1	L	-10°-50°	L	-10°	L	12°
		R	-10°-50°	R	-10°	R	14°
	BP2*	L	0°-50°	L	0°	L	8°
		R	0°-50°	R	0°	R	9°
	BP3	L	-10°-50°	L	-10°	L	-2°
		R	-10°-50°	R	-10°	R	-1°
	BP4	L	-10°-50°	L	-10°	L	-1°
		R	-10°-50°	R	-10°	R	-5°
REAR PILLAR	RP1	L	-10°-50°	L	-10°	L	10°
		R	-10°-50°	R	-10°	R	15°
	RP2	L	-10°-50°	L	-10°	L	6°
		R	-10°-50°	R	-10°	R	3°
UPPER ROOF 1		0°-50°		0°		48°	
UPPER ROOF 2		0°-50°		0°		44°	
UPPER ROOF 3		0°-50°		0°		47°	
UPPER ROOF 4		0°-50°		0°		50°	
UPPER ROOF 5		0°-50°		0°		40°	
UPPER ROOF 6		0°-50°		0°		44°	

As determined using the Procedures specified in S8.13.4.2. *Target BP2 is a seat belt anchorage location.

RECORDED BY: Matt Kerr

DATE: July 7, 2006

APPROVED BY: Helen A. Kaleto

TABLE 2-5
TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door Sedan

VEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: Beige

VEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

Measurement	Description	Left Side	Right Side
M	Seat Fore/Aft Travel (Front seats)	220 mm	220 mm
T°	Horizontal < {CG-F1 (Left Seat) to (Right A-Pillar)}	113.4°	--
A1°	360° - T°	246.6°	--
W°	Horizontal < {CG-F2 (Left Seat) to (Left A-Pillar)}	199.4°	--
A2°	A2° = W°	199.4°	--
U°	Horizontal < {CG-F2 (Left Seat) to (Left B-Pillar)}	273.5°	--
B1°	B1° = U°	273.5°	--
V°	Horizontal < {CG-R (Left Seat) to (Left B-Pillar)}	201.6°	--
B2°	B2° = V°	201.6°	--
W° (right)	Horizontal < {CG-F2 (Right Seat) to (Right A-Pillar)}	--	159.2°
A1° (right)	A1° (right) = W° (right)	--	159.2°
T ° (right)	Horizontal < {CG-F1 (Right Seat) to (Left A-Pillar)}	--	.245.6°
A2° (right)	360°-T° (right)	--	114.4°
V ° (right)	Horizontal < {CG-R (Right Seat) to (Right B-Pillar)}	--	158.1°
B1° (right)	B1° (right) = V° (right)	--	158.1°
U ° (right)	Horizontal < {CG-F2 (Right Seat) to (Right B-Pillar)}	--	82.5°
B2° (right)	B2° (right) = U° (right)	--	82.5°
J	A-Pillar {(Plane 3) - (Plane 5)}	347.9 mm	353.8 mm
J/2	J ÷ 2	174.0 mm	176.9 mm
D1	Upper Roof {(Plane A) - (Plane B)}	1440.0 mm	
D1/2	D1 ÷ 2	720.0 mm	
D2	Upper Roof {(Plane C) - (Plane D)}	1107.7 mm	

Measurement	Description	Left Side	Right Side
D2/2	$D2 \div 2$	553.9 mm	
.35D1	.35 x D1	504.0 mm	
.35D2	.35 x D2	387.7 mm	
N	B-Pillar {(BPR) - (lowest point on daylight opening forward of B-Pillar)}	415.8 mm	424.2 mm
N/2	B-Pillar {(BP3) - (lowest point on daylight opening forward of B-Pillar)}	207.9 mm	212.1 mm
N/4	B-Pillar {(BP4) - (lowest point on daylight opening forward of B-Pillar)}	104.0 mm	106.1 mm
D	R-Pillar (Point 7 – Point M)	635.0 mm	635.0 mm
3D/7	$3 \times D / 7$	272.1 mm	272.1 mm

As determined using the Procedures specified in S10.1-10.13.

SgRP Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	1344.3	-334.8	289.9	1342.0	334.9	290.1
Rear Row	2073.7	-324.8	288.2	2071.5	324.9	288.4

SgRP Locations (vehicle coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	1348.0	-335.0	288.0	1348.0	335.0	288.0
Rear	2080.0	-325.0	288.0	2080.0	325.0	288.0

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	Z
CGF1	1288.0	-334.8	949.9	1502.0	334.9	950.1
CGF2	1288.0	-334.8	949.9	1502.0	334.9	950.1
CGR	2233.7	-324.8	948.2	2231.5	324.9	948.4

REFERENCE FOR VEHICLE COORDINATE SYSTEM (measured in millimeters):

Driver outboard, front seat anchorage (x, y, z) = 985, -570, 84.7

Driver outboard, rear seat anchorage (x, y, z) = 1423, -580, 56.0

Passenger outboard, front seat anchorage (x, y, z) = 985, 570, 84.7

REMARKS:

RECORDED BY: Matt Kerr

DATE: July 7, 2006

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2006 Hyundai Accent, 4-Door Sedan

VEH. NHTSA NO.: C60508 VIN: KMHCHN46C46U016321 COLOR: Beige

VEH. BUILD DATE: December, 2005 TEST DATES: July 12-13, 2006

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Matt Kerr, Bryan Hood, Scott Keyser

SUMMARY OF TARGETING RESULTS								
Target	Location (mm)			Horizontal Angle (deg)	Vertical Angle (deg)	Relocation (Yes/No)	Extension (# of 25 mm Spheres)	Impact (Yes/No)
	x	y	z					
A-Pillar Left Side								
AP1	1102.7	-496.1	1089.6	--	--	Yes	--	--
REL	1114.1	-512.6	1046.0	236	23		2	No
AP2	1028.0	-533.8	1009.4	201	50	No	--	Yes
AP3	829.7	-573.1	916.6	201	43	No	--	No
A-Pillar Right Side								
AP1	1105.0	501.5	1094.0	--	--	Yes	--	--
REL	1115.4	516.4	1046.2	125	23	--	2	Yes
AP2	1036.1	540.5	1006.7	158	50	No	--	No
AP3	828.9	572.3	916.4	158	45	No	--	Yes
B-Pillar Left Side								
BP1	1580.1	-455.6	1143.9	270	12	No	--	Yes
BP2	1541.4	-559.8	919.9	270	8	No	--	Yes
BP3	1509.2	-577.5	936.7	--	--	Yes	--	--
REL	1511.0	-568.4	959.4	270	-2	--	1	No
BP4	1595.1	-616.6	834.0	202	-1	No	--	No
B-Pillar Right Side								
BP1	1579.4	452.3	1146.7	90	14	No	--	No
BP2	1549.0	561.2	916.8	90	9	No	--	No
BP3	1512.3	578.3	933.8	--	--	Yes	--	--

SUMMARY OF TARGETING RESULTS								
Target	Location (mm)			Horizontal Angle (deg)	Vertical Angle (deg)	Relocation (Yes/No)	Extension (# of 25 mm Spheres)	Impact (Yes/No)
	x	y	z					
REL	1519.7	567.5	956.6	90	-1	--	1	Yes
BP4	1601.0	616.0	827.7	158	-5	No	--	Yes
Rear Pillar Left Side								
RP1	2282.9	-462.4	1089.4	270	10	No	--	No
RP2	2406.7	-562.2	939.1	320	6	No	--	No
Rear Pillar Right Side								
RP1	2282.3	459.5	1080.0	90	15	No	--	No
RP2	2415.6	567.9	930.8	40	3	No	--	No
Front Header Left Side								
FH1	1037.8	-380.7	1095.3	180	50	No	--	No
FH2	1026.2	-230.3	1103.9	180	50	No	--	No
Front Header Right Side								
FH1	1045.9	391.1	1094.4	180	50	No	--	No
FH2	1033.0	241.3	1103.3	180	50	No	--	No
Side Rail Left Side								
SR1	1253.5	-464.1	1125.8	--	--	Yes	--	--
REL	1232.5	-490.7	1095.1	270	9	--	2	No
SR2A	1402.4	-463.4	1143.6	--	--	Yes	--	--
REL	1402.1	-437.9	1150.2	270	29	--	1	No
SR2B	1280.2	-464.5	1130.2	--	--	Yes	--	--
REL	1311.5	-487.6	1103.1	270	9	--	2	No
SR3-1	1909.0	-426.1	1135.7	270	42	--	--	No
SR3-2	2059.0	-441.8	1116.5	270	39	--	--	No
Side Rail Right Side								
SR1	1254.5	472.6	1127.0	--	--	Yes	--	--
REL	1270.4	453.9	1107.9	90	40	--	1	No
SR2A	1404.8	464.3	1145.3	--	--	Yes	--	--
REL	1447.6	441.1	1129.3	90	43	--	2	No
SR2B	1279.4	459.7	1107.7	90	33	No	--	No

SUMMARY OF TARGETING RESULTS								
Target	Location (mm)			Horizontal Angle (deg)	Vertical Angle (deg)	Relocation (Yes/No)	Extension (# of 25 mm Spheres)	Impact (Yes/No)
	x	y	z					
SR3-1	1914.2	428.8	1131.6	90	43	No	--	No
SR3-2	2064.9	442.6	1112.9	90	39	No	--	No
Rear Header Left Side								
RH	2257.6	-323.9	1132.6	0	50	No	--	No
Rear Header Right Side								
RH	2258.1	324.0	1127.9	0	50	No	--	No
Upper Roof Left Side								
UR1	1197.7	-381.4	1124.1	270	48	No	--	No
UR2	1403.8	-380.1	1167.0	270	44	No	--	No
UR3	2176.2	-383.4	1142.5	270	47	No	--	No
Upper Roof Right Side								
UR4	1236.6	376.8	1133.3	90	50	No	--	No
UR5	1588.2	376.5	1173.7	90	40	No	--	No
UR6	2058.3	340.4	1161.0	90	44	No	--	No

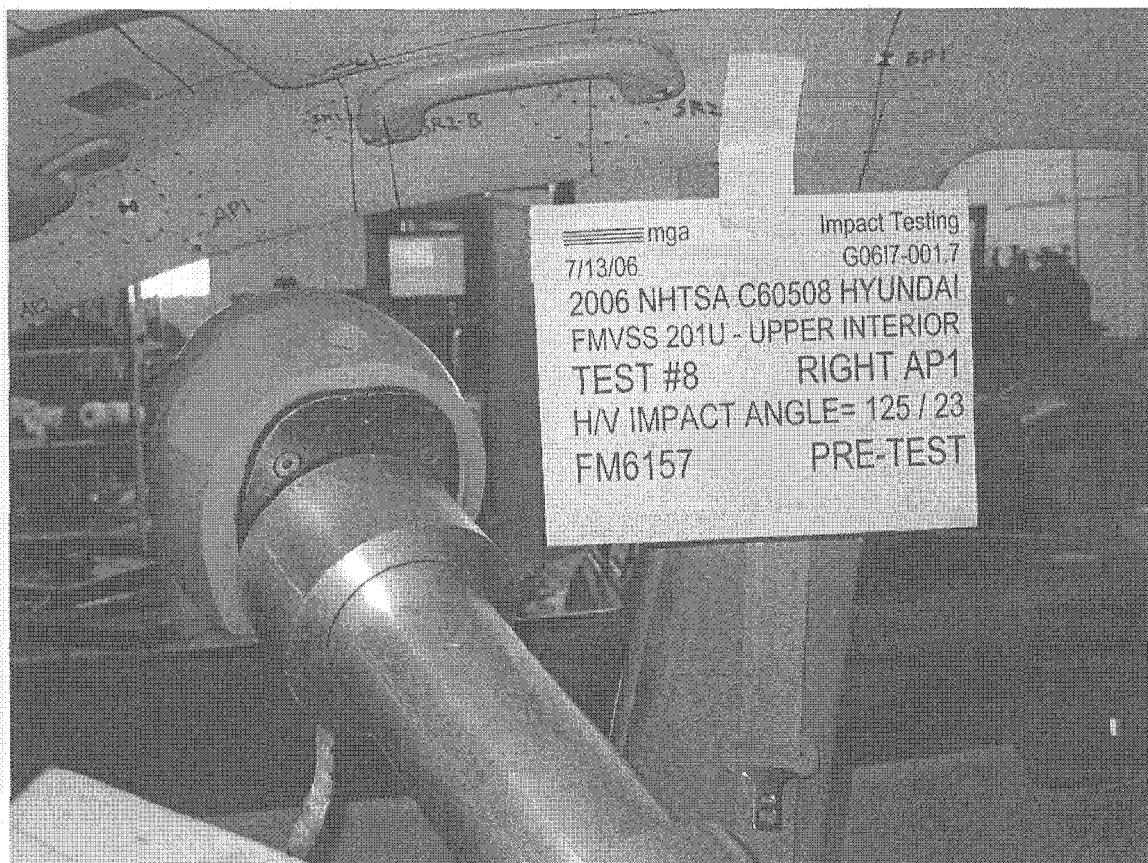
As determined using the Procedures specified in S10.1-10.13.

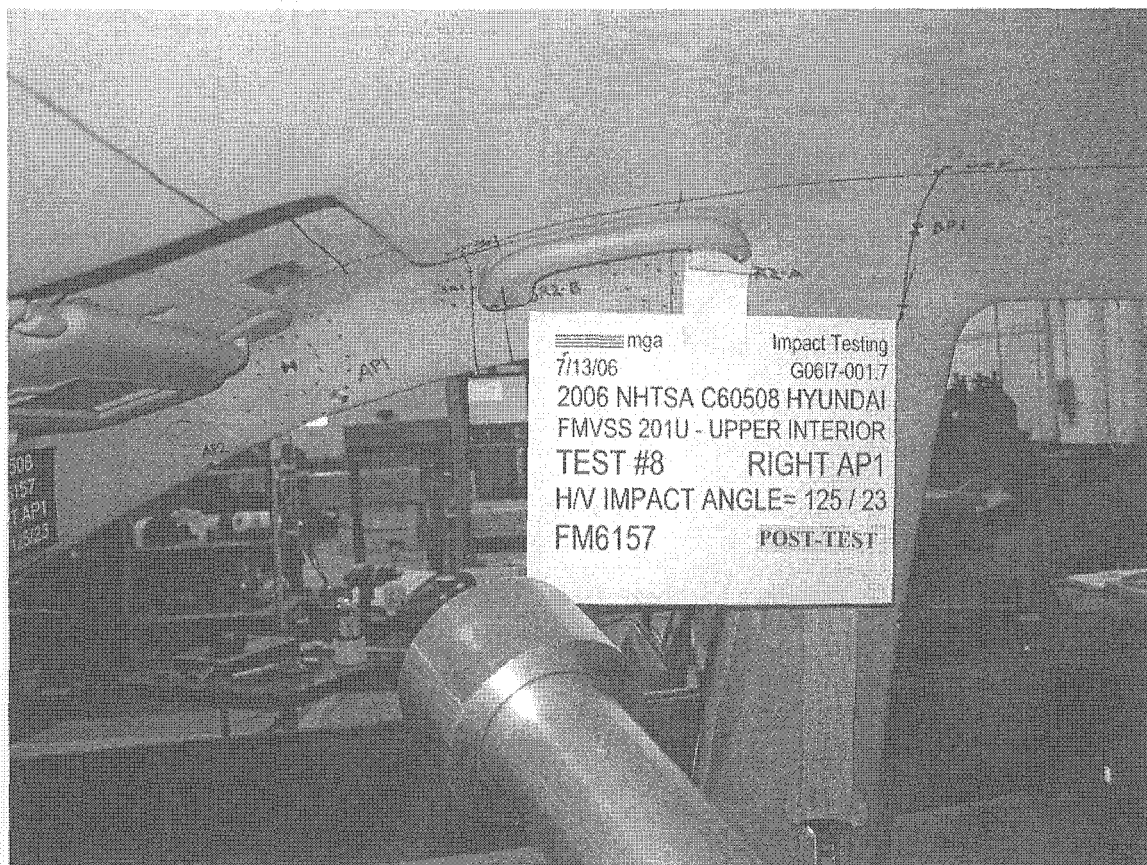
REMARKS: Targets AP1, AP2, AP3, BP1, RP1, SR1, SR2A, SR2B, SR3-1, and SR3-2 are located in the curtain airbag zone and subject to a reduced velocity impact.

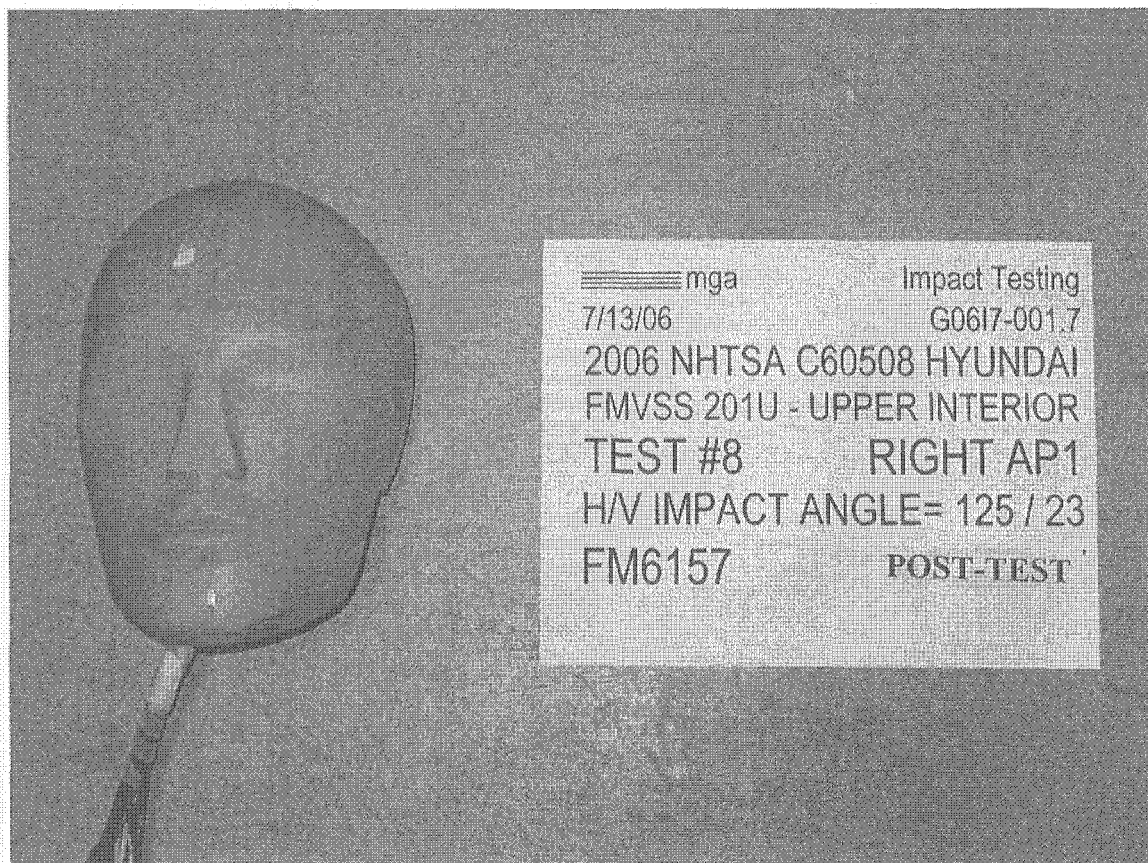
RECORDED BY: Matt Kerr

DATE: July 7, 2006

APPROVED BY: Helen A. Kaleto







SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0617-001.7

VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#8

Target (Vehicle Side): AP1Right

Temperature:22C

MGA Test Reference No.:FM6157

Humidity:46%

Approach Horizontal Angles:125°

Time of Test:12:00 PM

Approach Vertical Angles:23°

FMH Serial No:[039]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
304	182	8.4	19.2	25	12 Right

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J13753	-103.6	1.54	1.54
Y	6	J22700	94.4	1.53	1.53
Z	7	J32734	95.5	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

FMH
G06I7-001.7

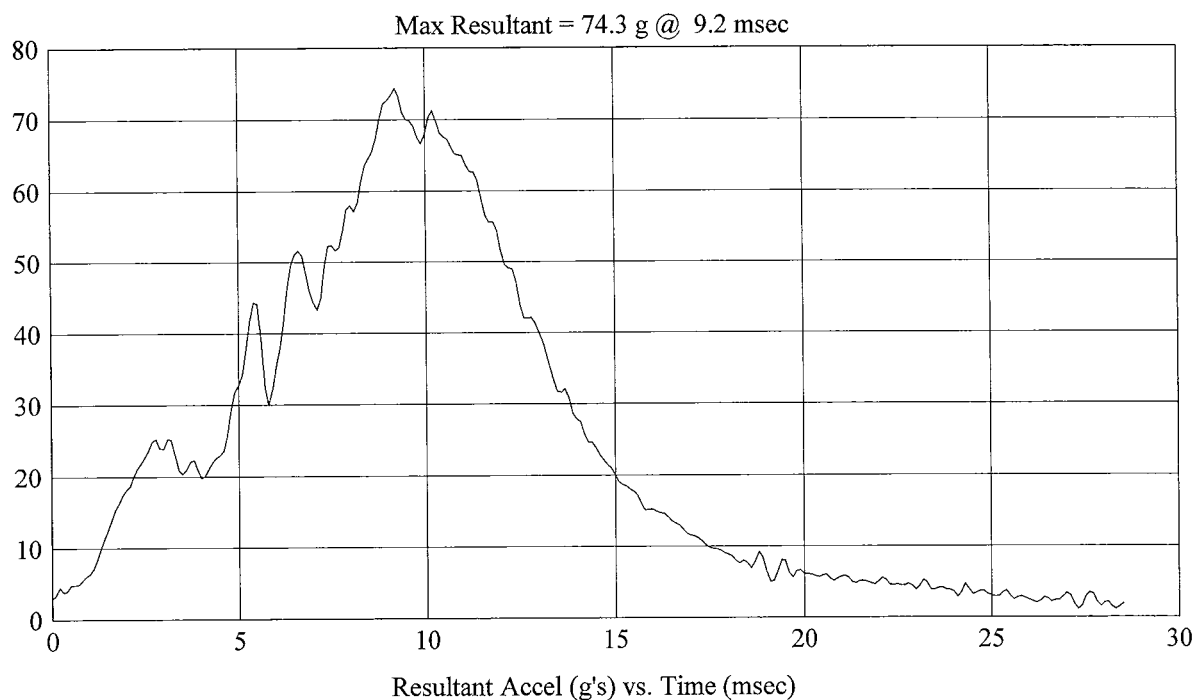
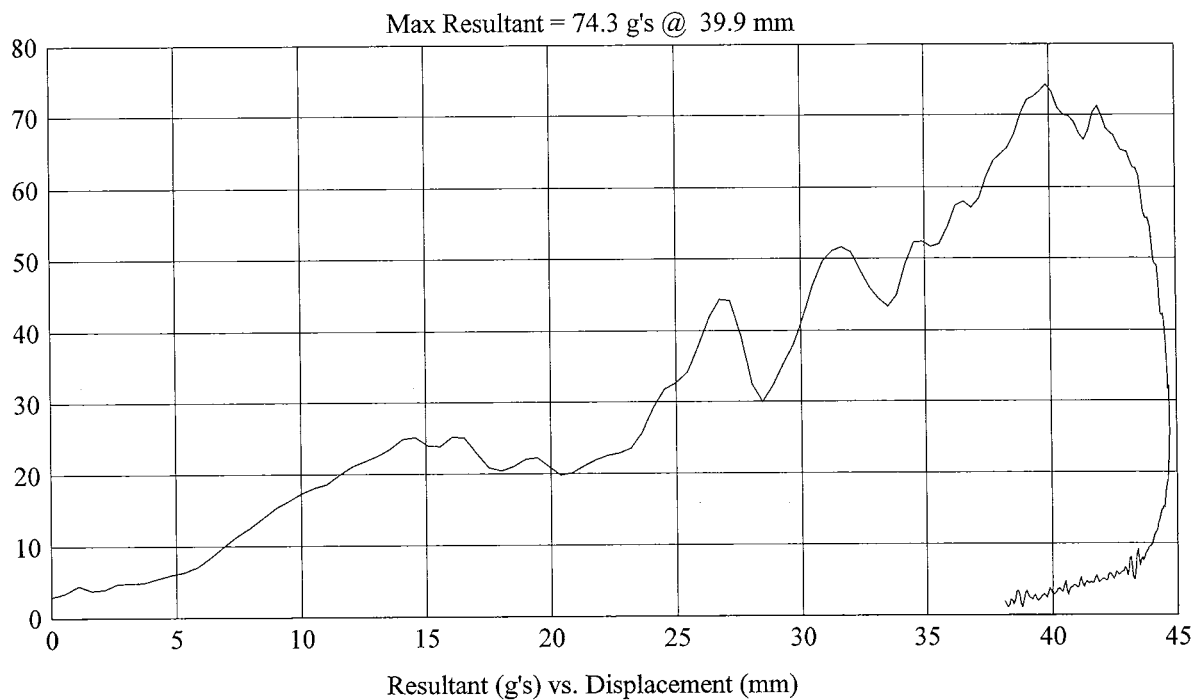
Customer: NHTSA
Test # 8
FM6157
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 125/23

HIC(d) = 304, HIC = 182, Delta T = 8.4 msec



FMH
G06I7-001.7

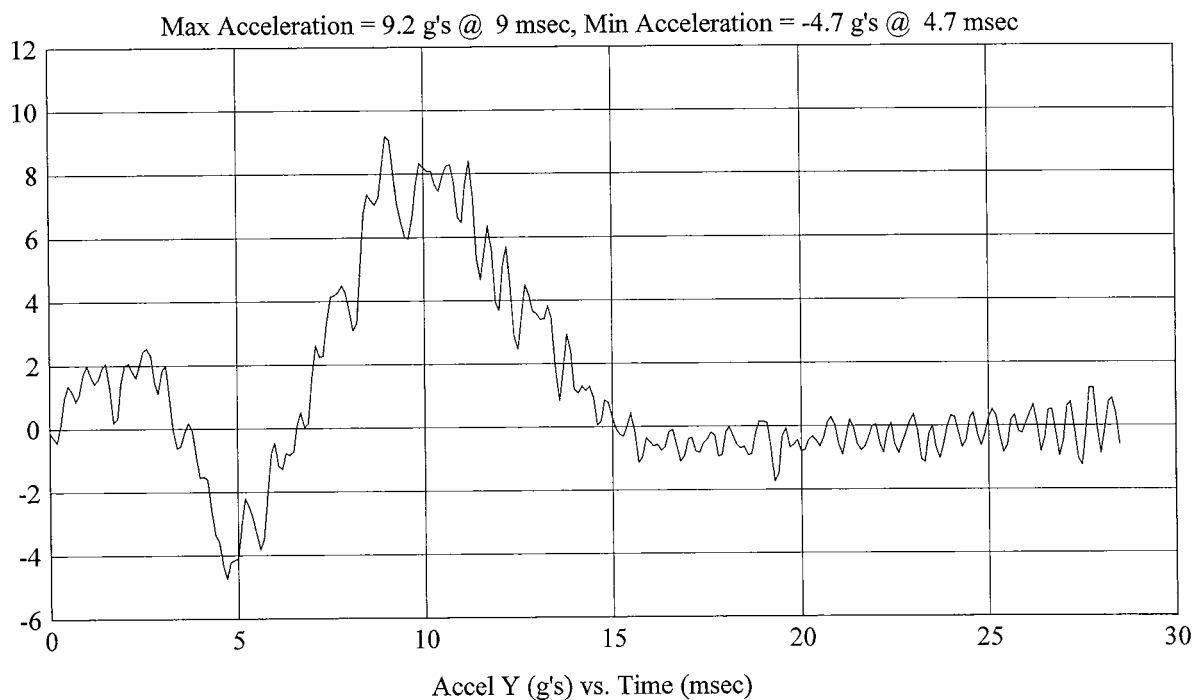
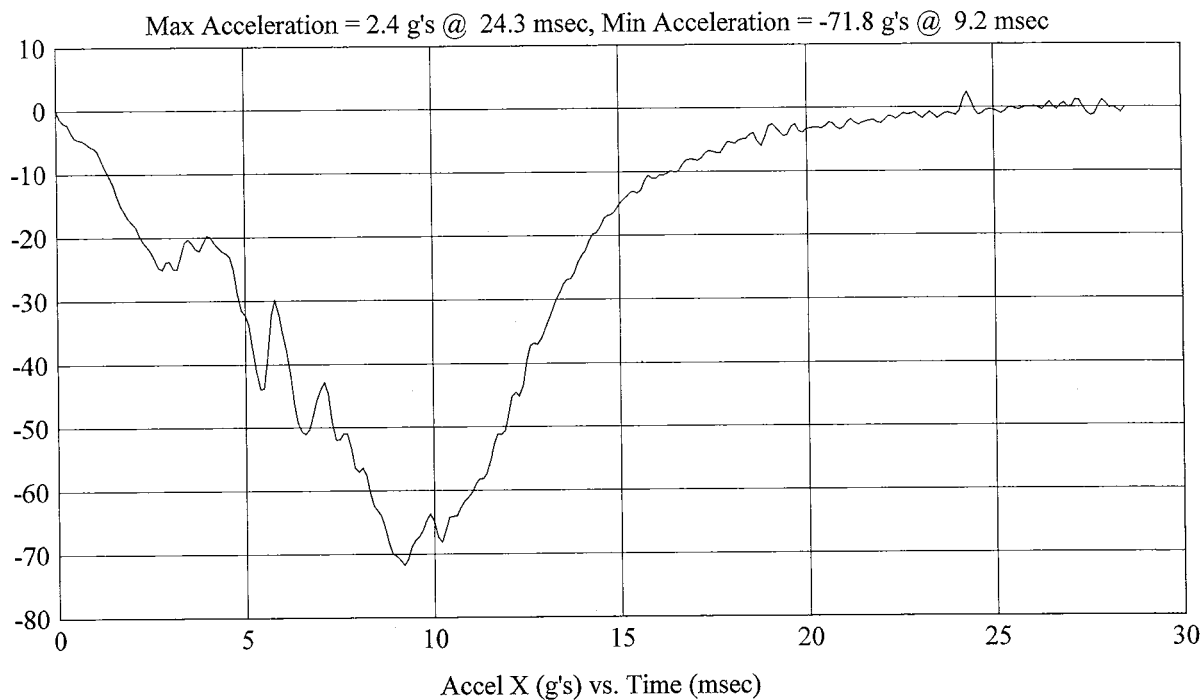
Customer: NHTSA
Test # 8
FM6157
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 125/23

HIC(d) = 304, HIC = 182, Delta T = 8.4 msec



FMH
G06I7-001.7

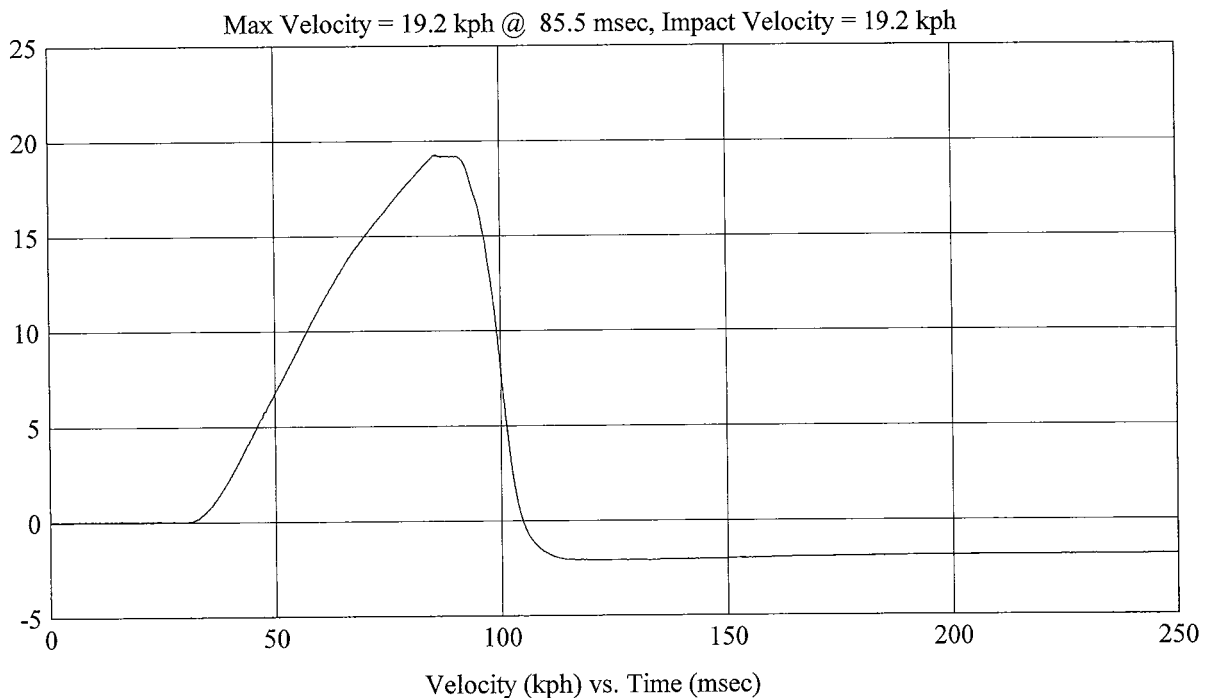
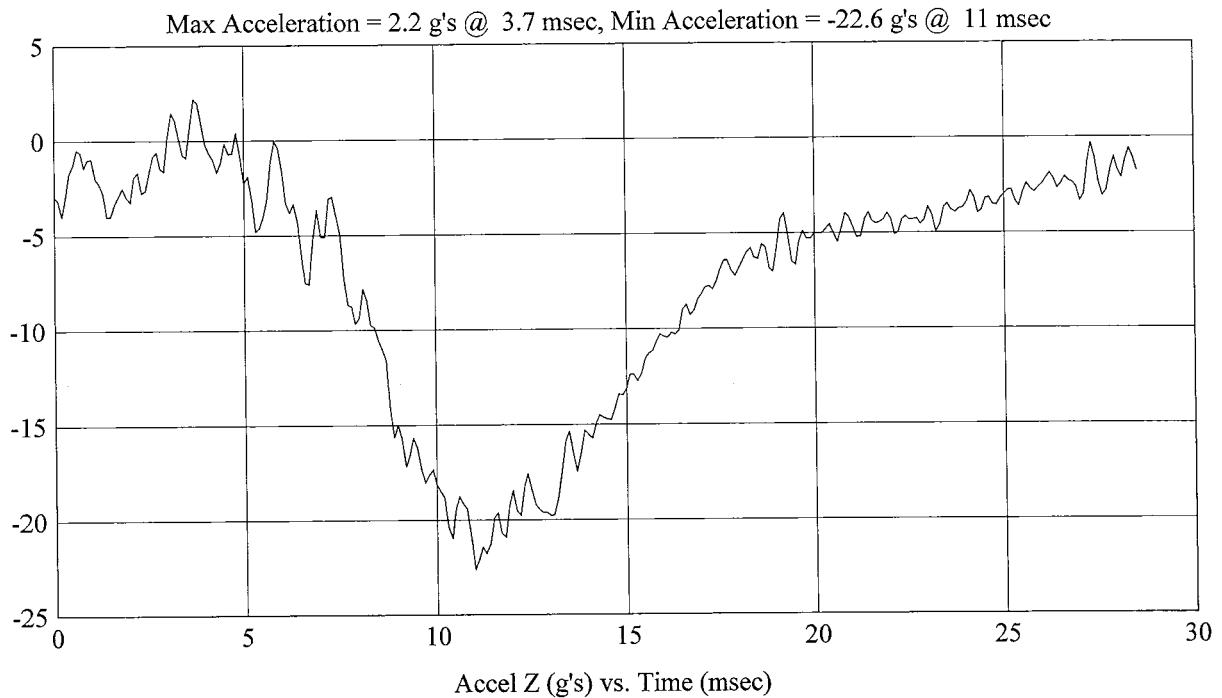
Customer: NHTSA
Test # 8
FM6157
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 125/23

HIC(d) = 304, HIC = 182, Delta T = 8.4 msec



FMH
G06I7-001.7

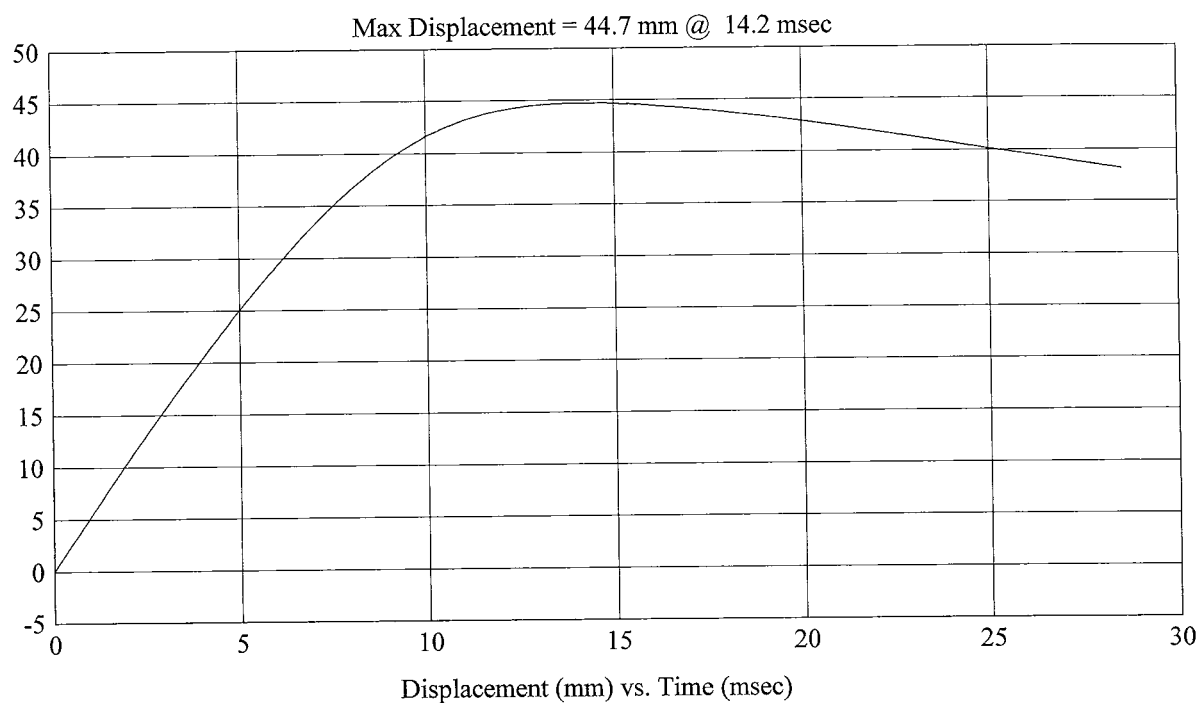
Customer: NHTSA
Test # 8
FM6157
Additional Desc: N/A

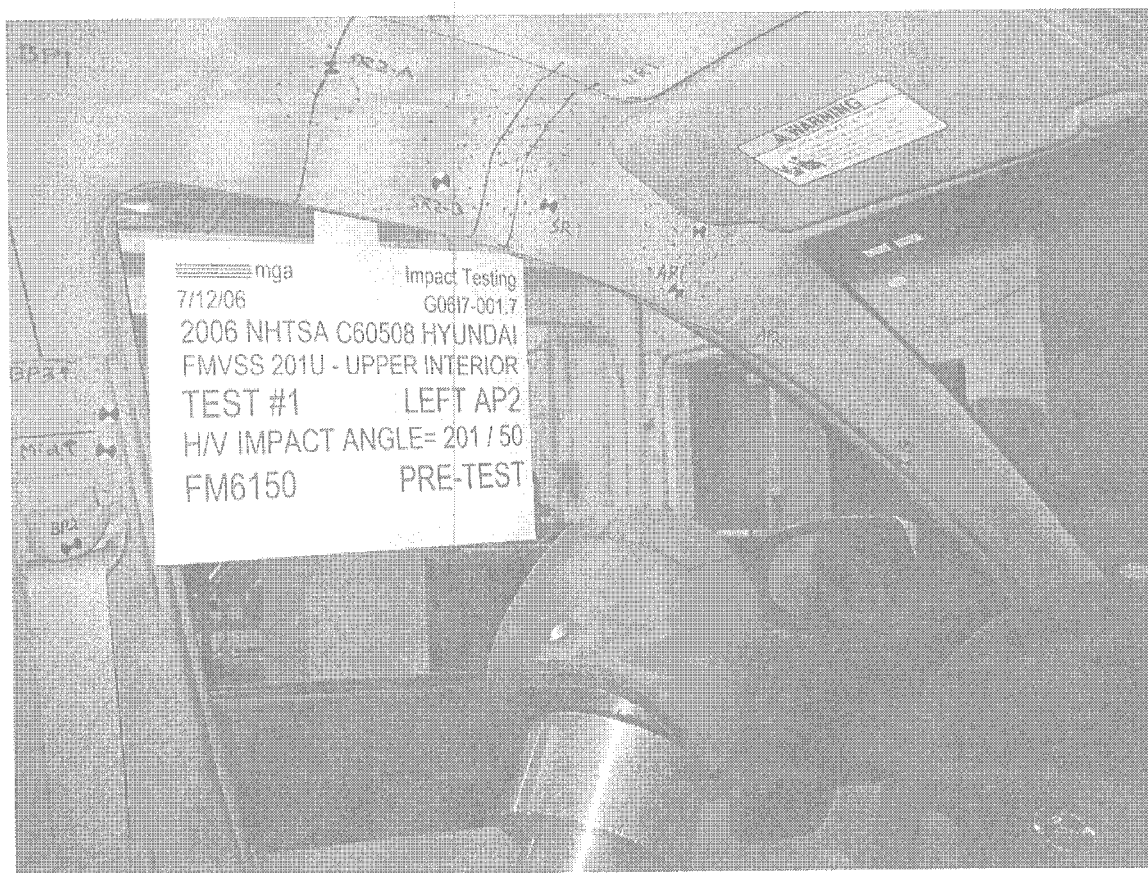
Vehicle Program : Hyundai

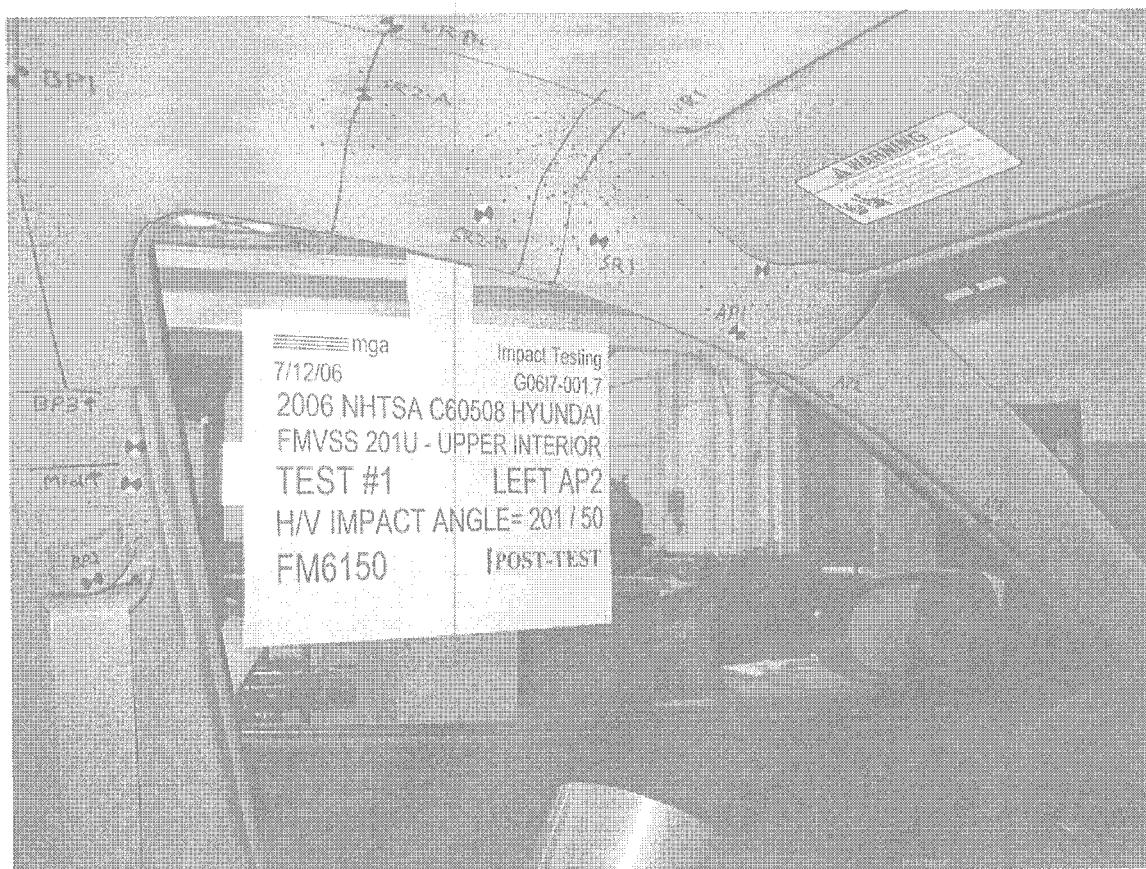
Test Date: 7/13/06

Model Year: 2006
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 125/23

HIC(d) = 304, HIC = 182, Delta T = 8.4 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0617-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): AP2Left

Temperature:23C

MGA Test Reference No.:FM6150

Humidity:55%

Approach Horizontal Angles:201°

Time of Test:10:30 AM

Approach Vertical Angles:50°

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
355	250	12.2	19.4	10	10 Right

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35924	-91.4	1.54	1.54
Y	6	J35919	94.4	1.53	1.53
Z	7	J22664	94.3	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

A-pillar cracked and dislodged.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

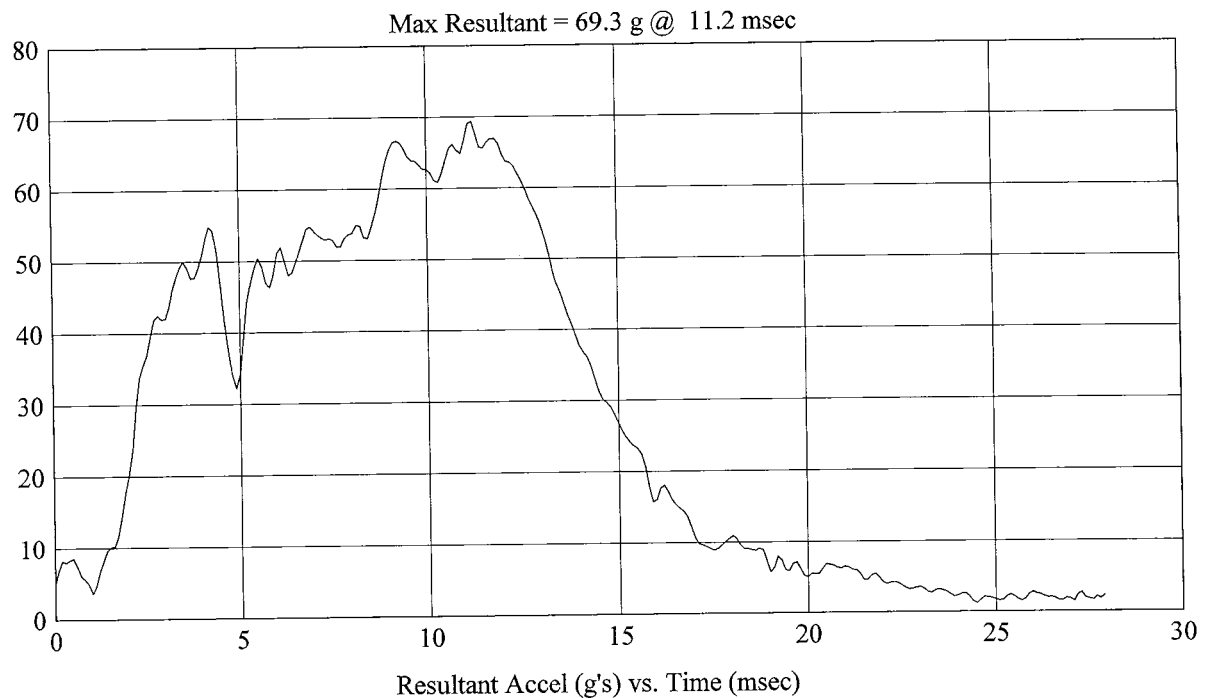
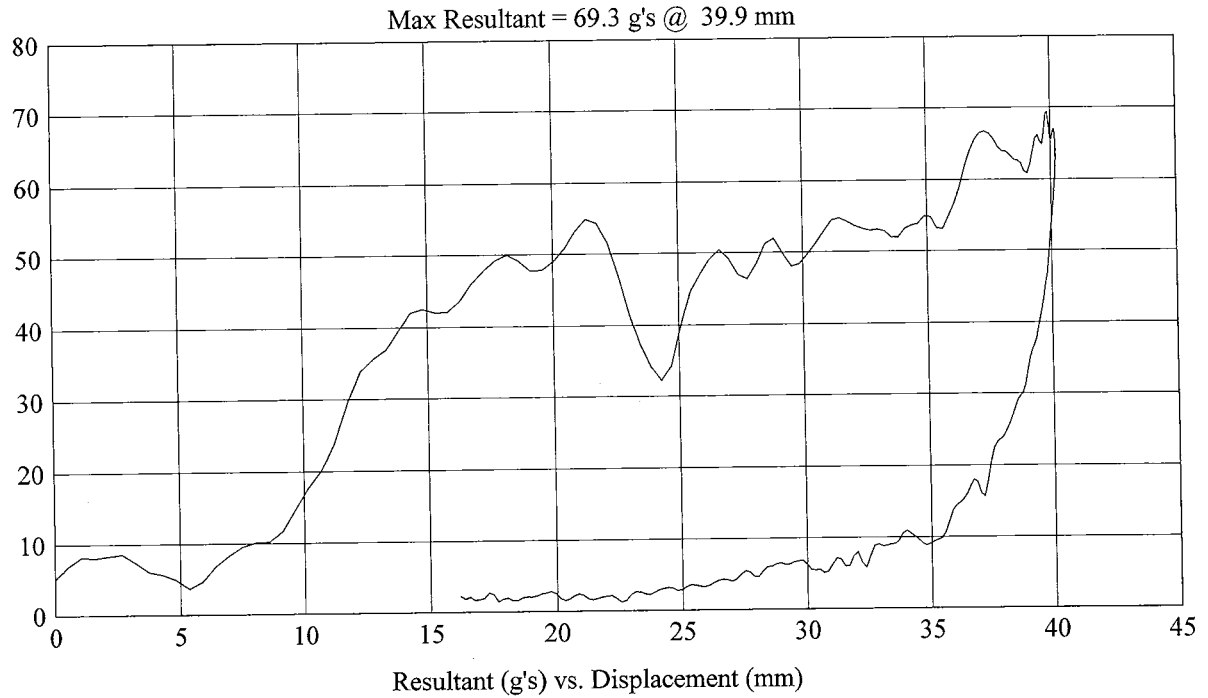
FMH
G06I7-001.7

Customer: NHTSA
Test # 1
FM6150
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 201/50

HIC(d) = 355, HIC = 250, Delta T = 12.2 msec



FMH
G0617-001.7

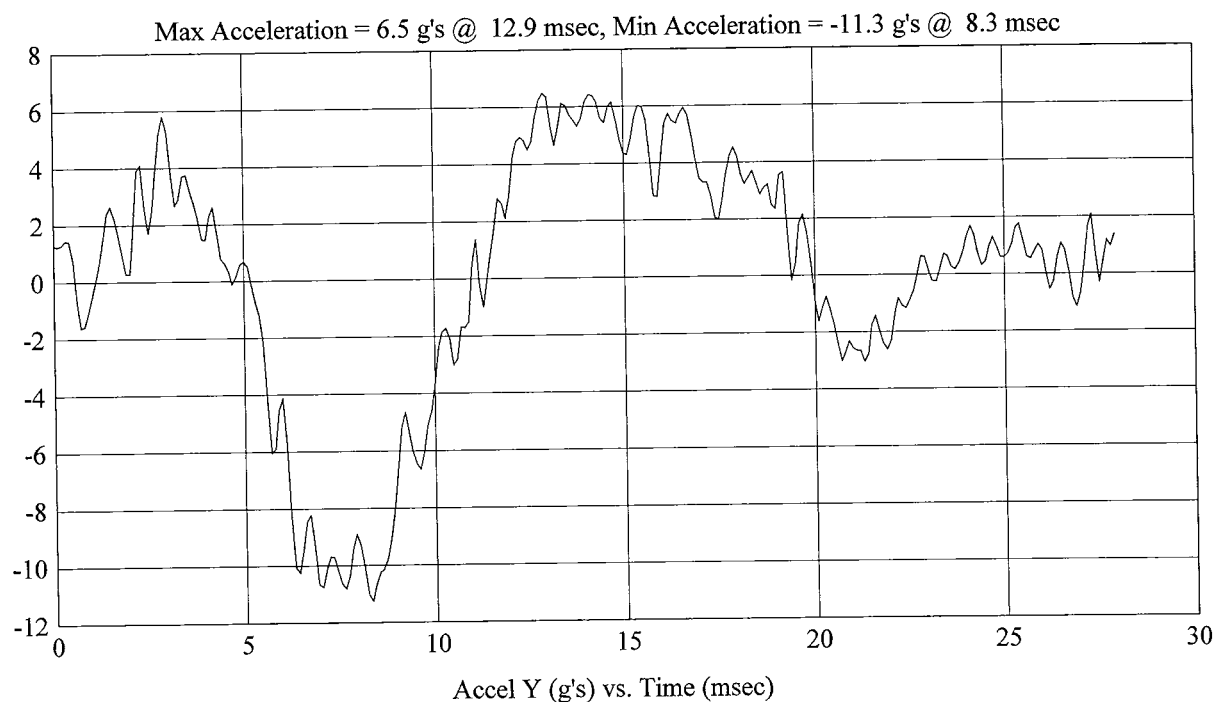
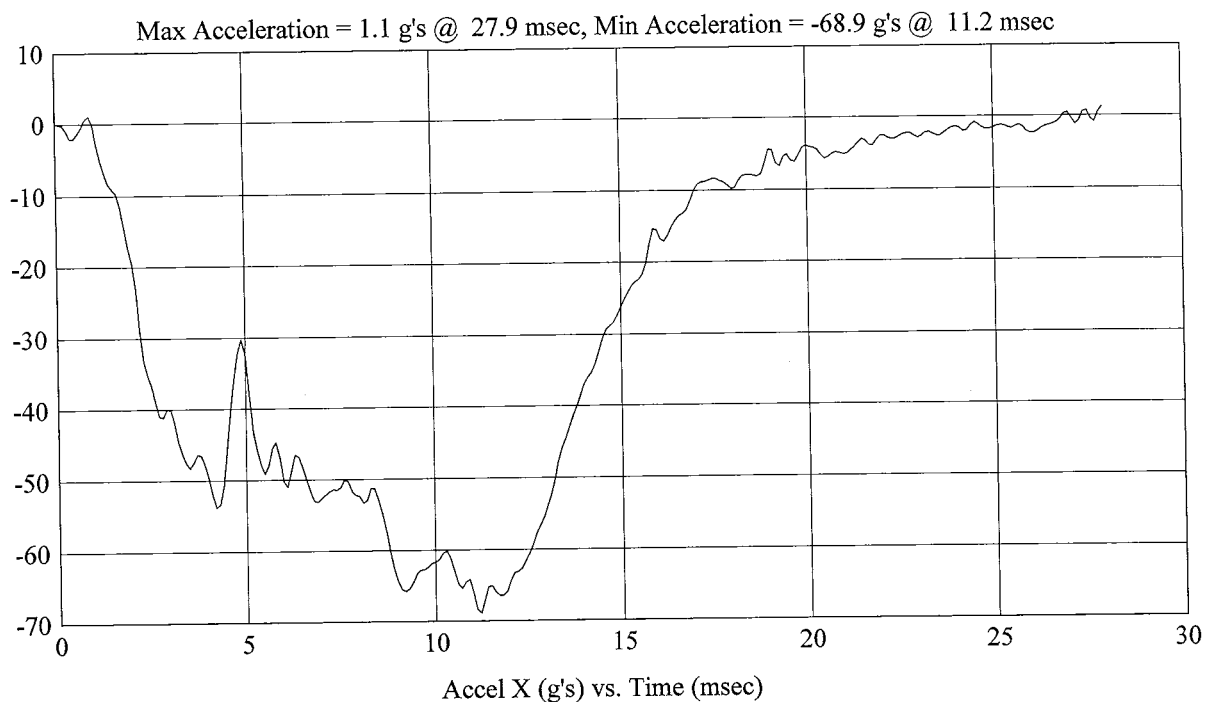
Customer: NHTSA
Test # 1
FM6150
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 201/50

HIC(d) = 355, HIC = 250, Delta T = 12.2 msec



FMH
G06I7-001.7

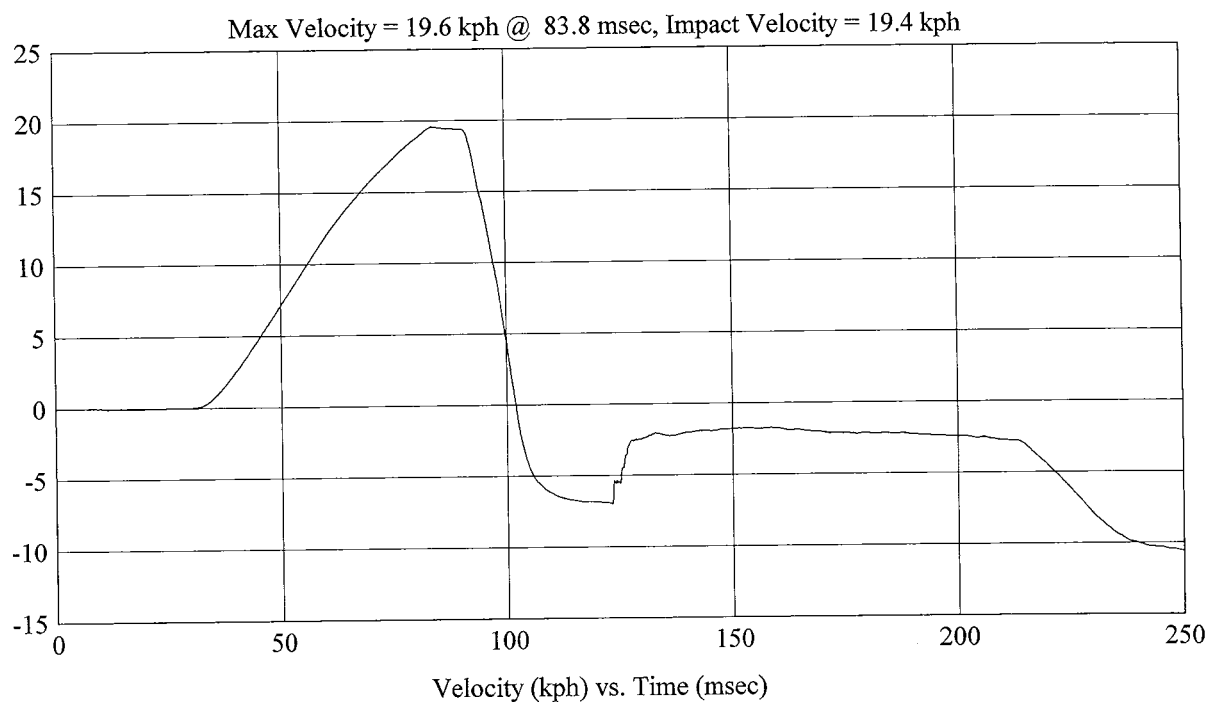
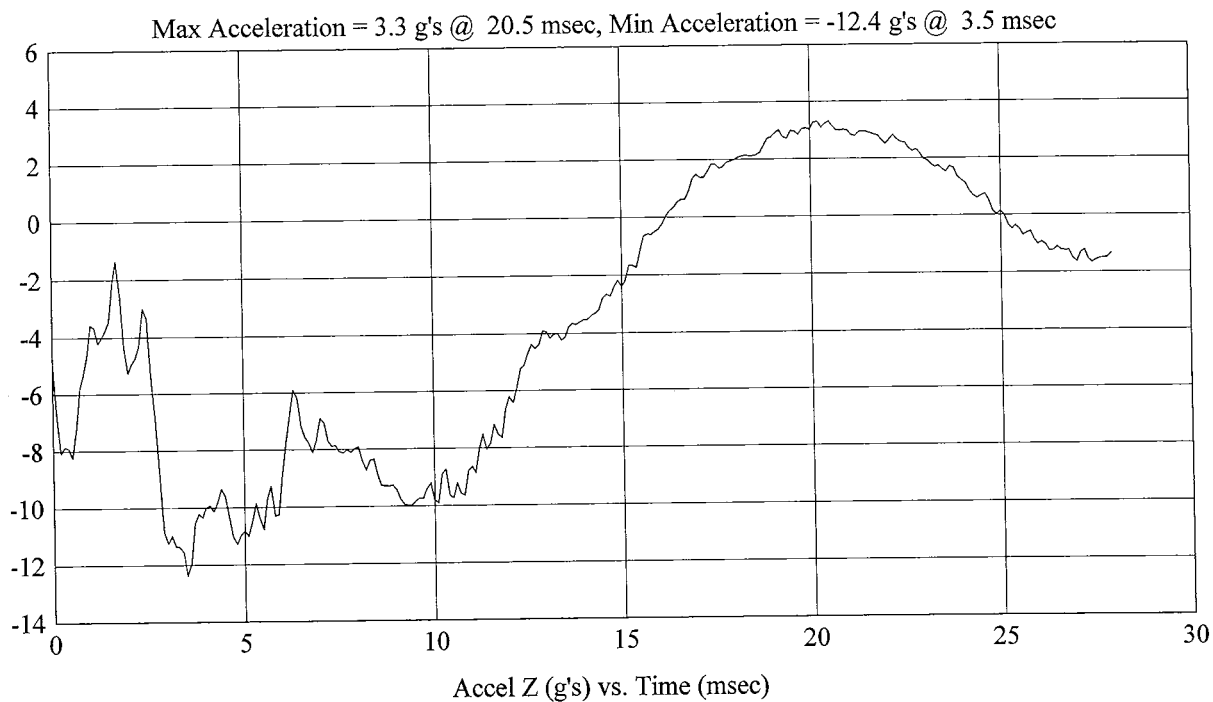
Customer: NHTSA
Test # 1
FM6150
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 201/50

HIC(d) = 355, HIC = 250, Delta T = 12.2 msec



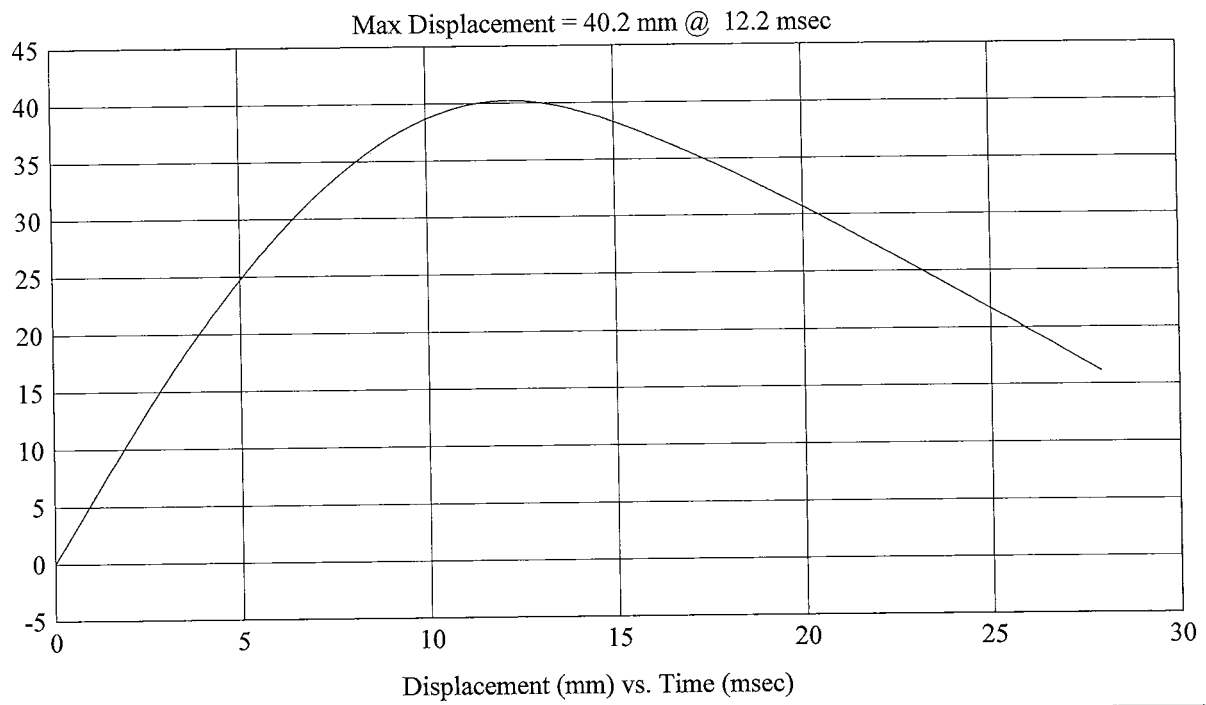
FMH
G06I7-001.7

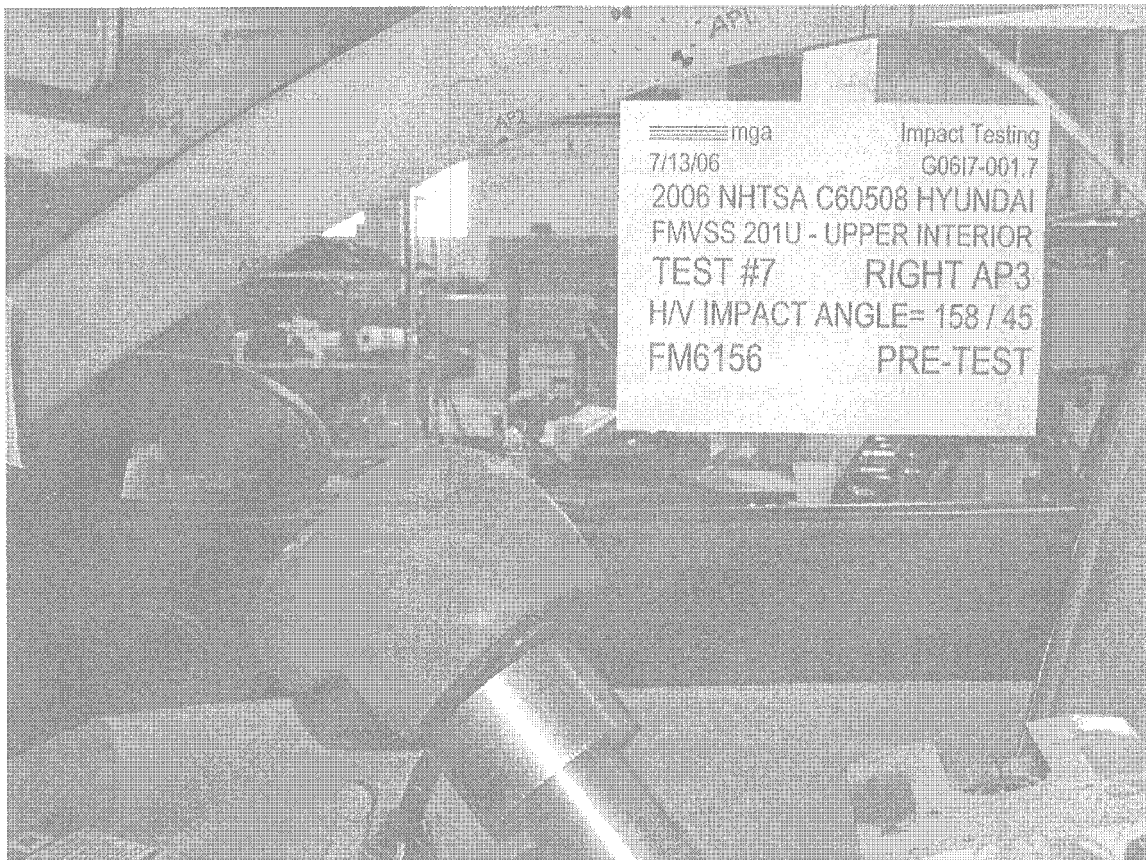
Customer: NHTSA
Test # 1
FM6150
Additional Desc: N/A

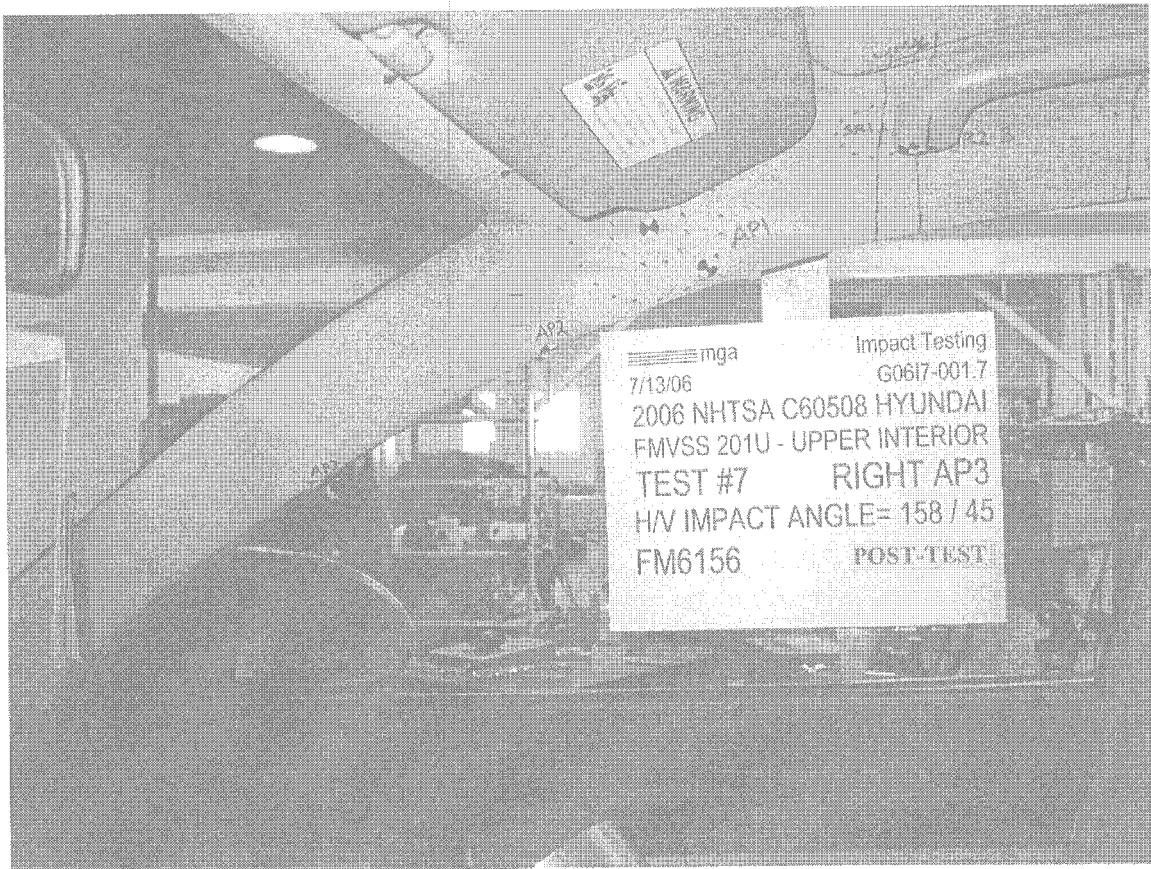
Vehicle Program : Hyundai
Test Date: 7/12/06

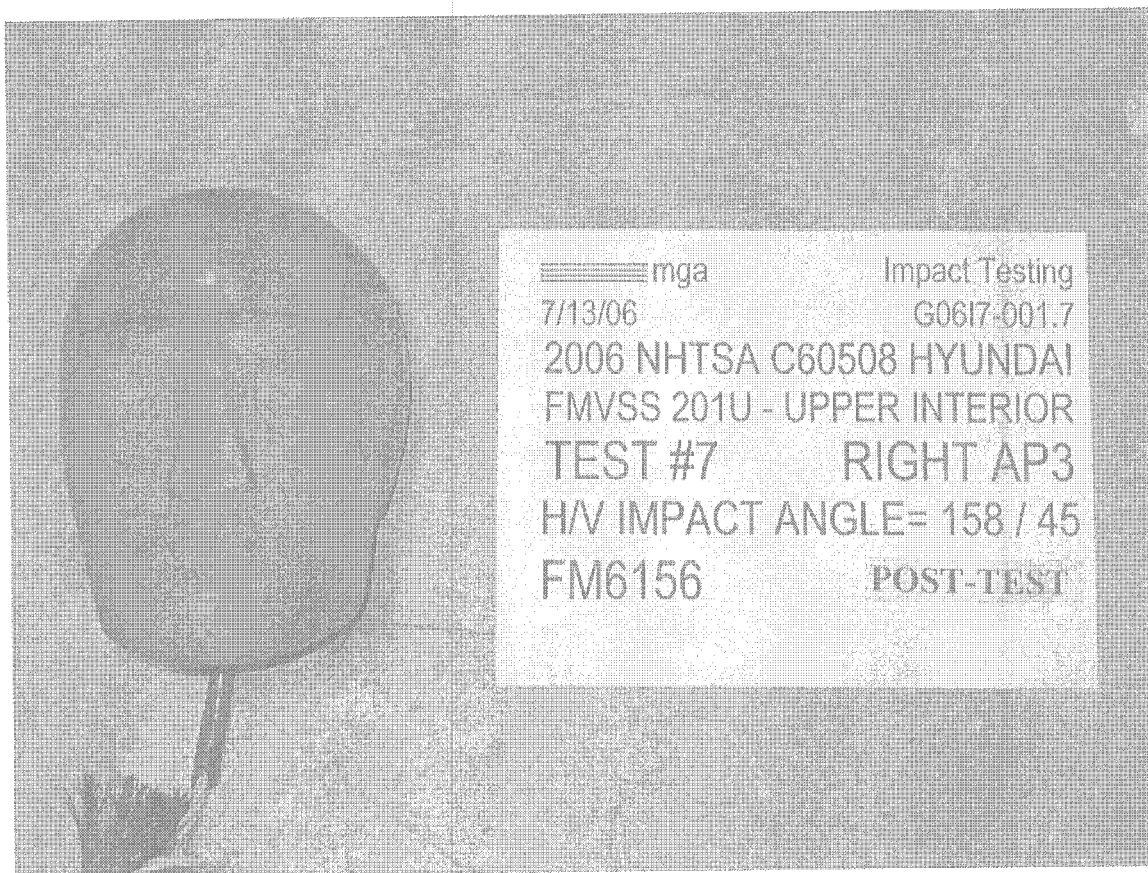
Model Year: 2006
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 201/50

HIC(d) = 355, HIC = 250, Delta T = 12.2 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#7

Target (Vehicle Side): AP3Right

Temperature:22C

MGA Test Reference No.:FM6156

Humidity:44%

Approach Horizontal Angles:158°

Time of Test:11:00 AM

Approach Vertical Angles:45°

FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
340	230	13	19.8	17	3 Left

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108.8	1.54	1.55
Y	6	J36193	102.7	1.53	1.53
Z	7	J36353	97.2	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Cracked pillar.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

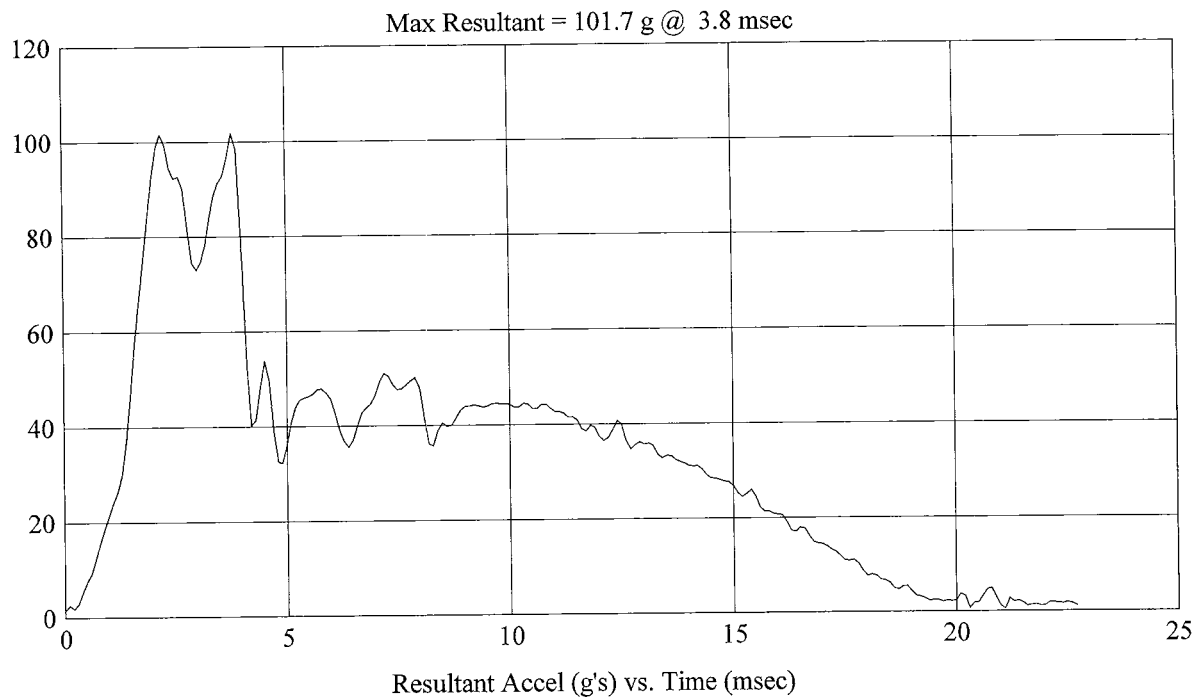
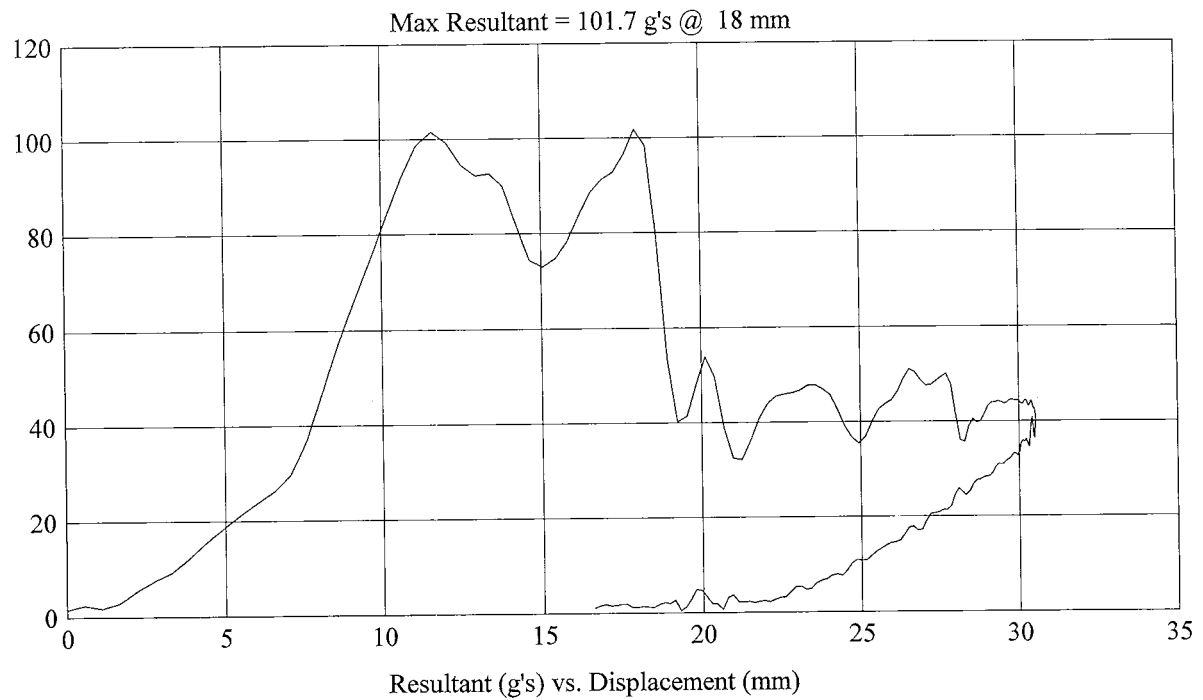
FMH
G06I7-001.7

Customer: NHTSA
Test # 7
FM6156
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 158/45

HIC(d) = 340, HIC = 230, Delta T = 13 msec



FMH
G06I7-001.7

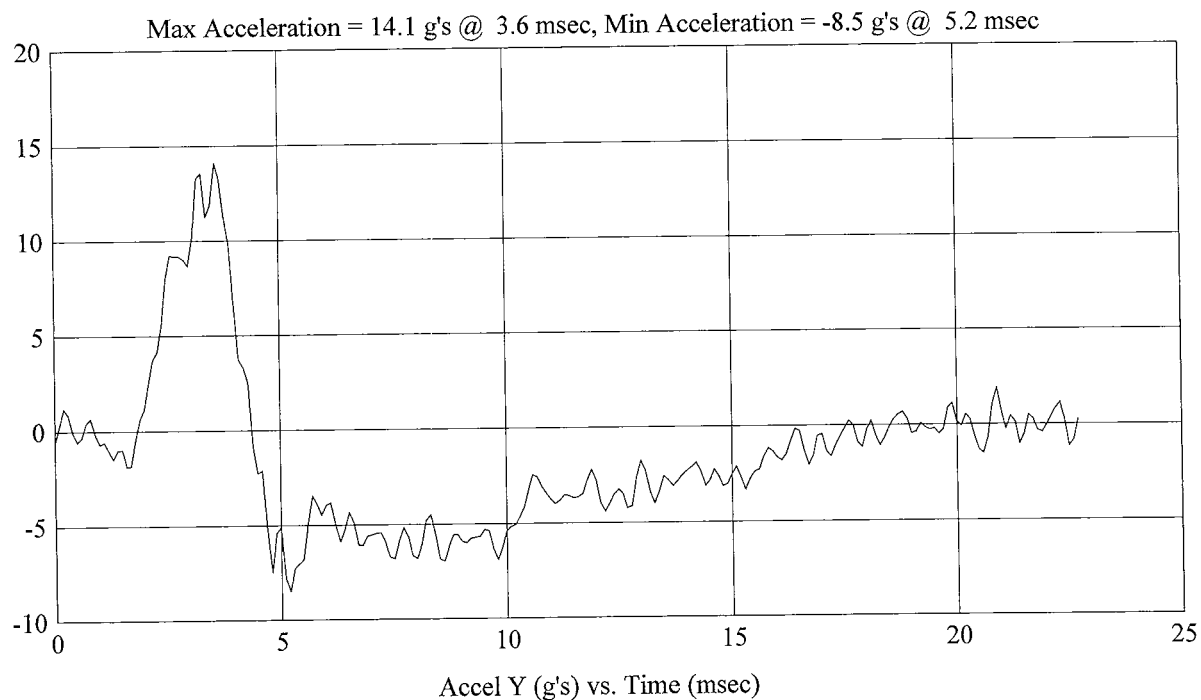
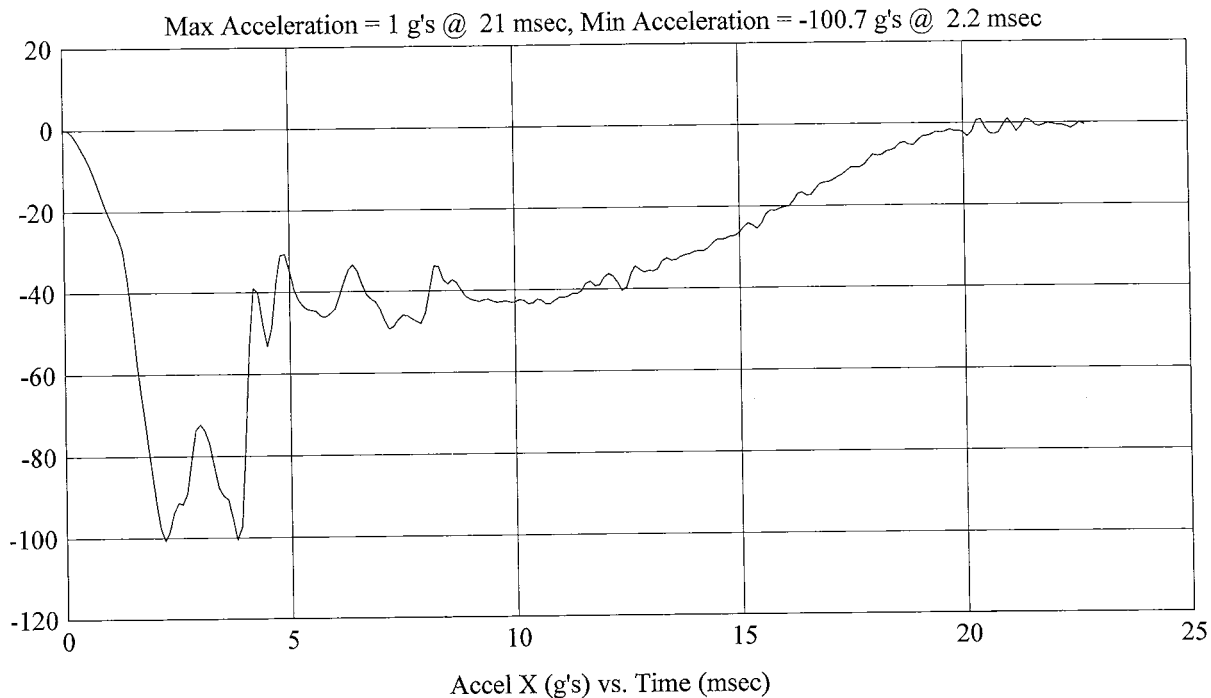
Customer: NHTSA
Test # 7
FM6156
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 158/45

HIC(d) = 340, HIC = 230, Delta T = 13 msec



FMH
G06I7-001.7

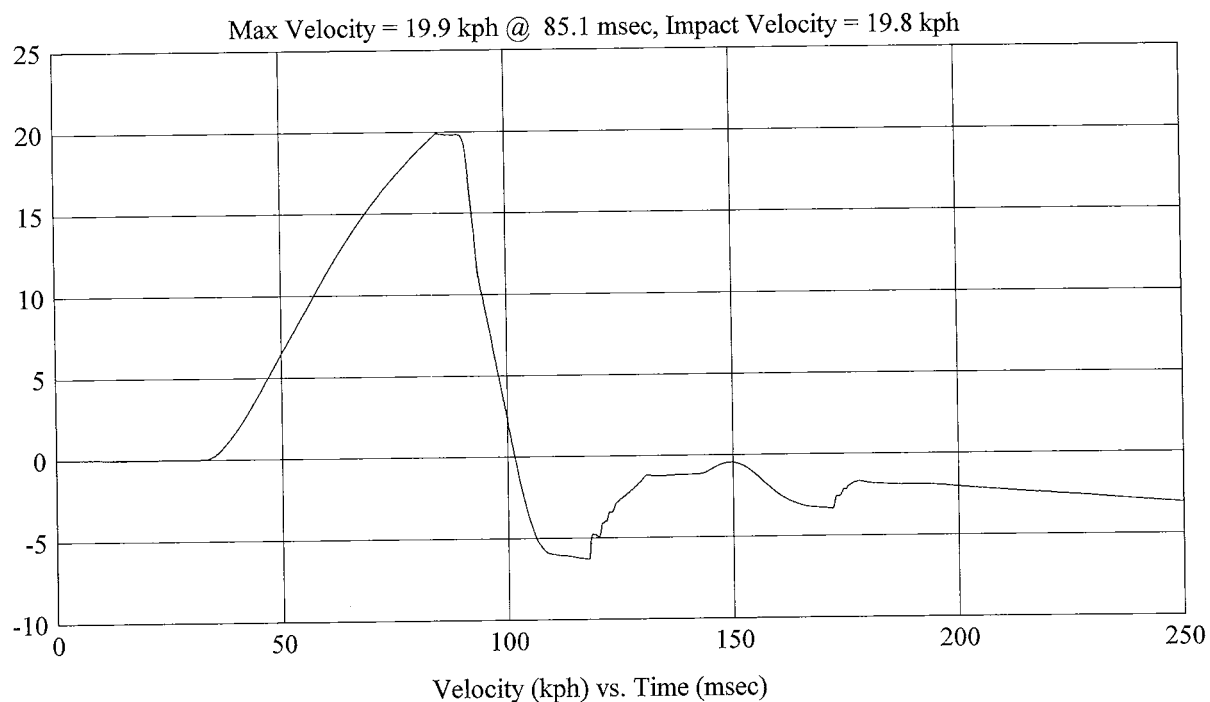
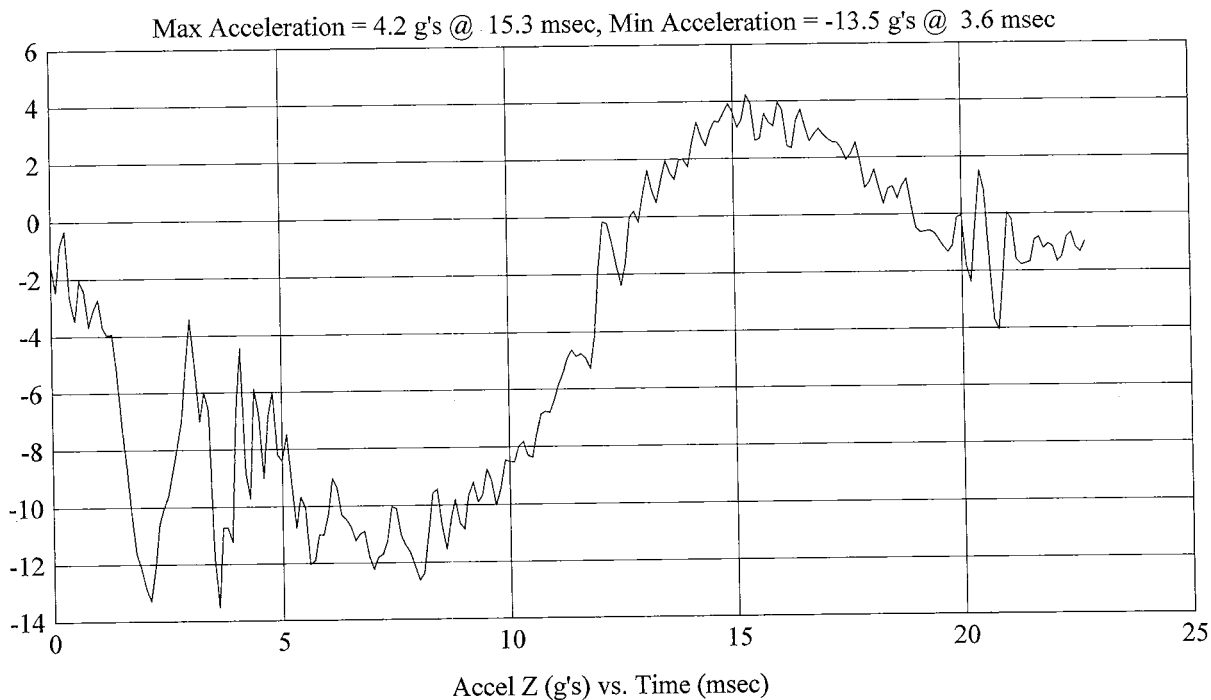
Customer: NHTSA
Test # 7
FM6156
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 158/45

HIC(d) = 340, HIC = 230, Delta T = 13 msec



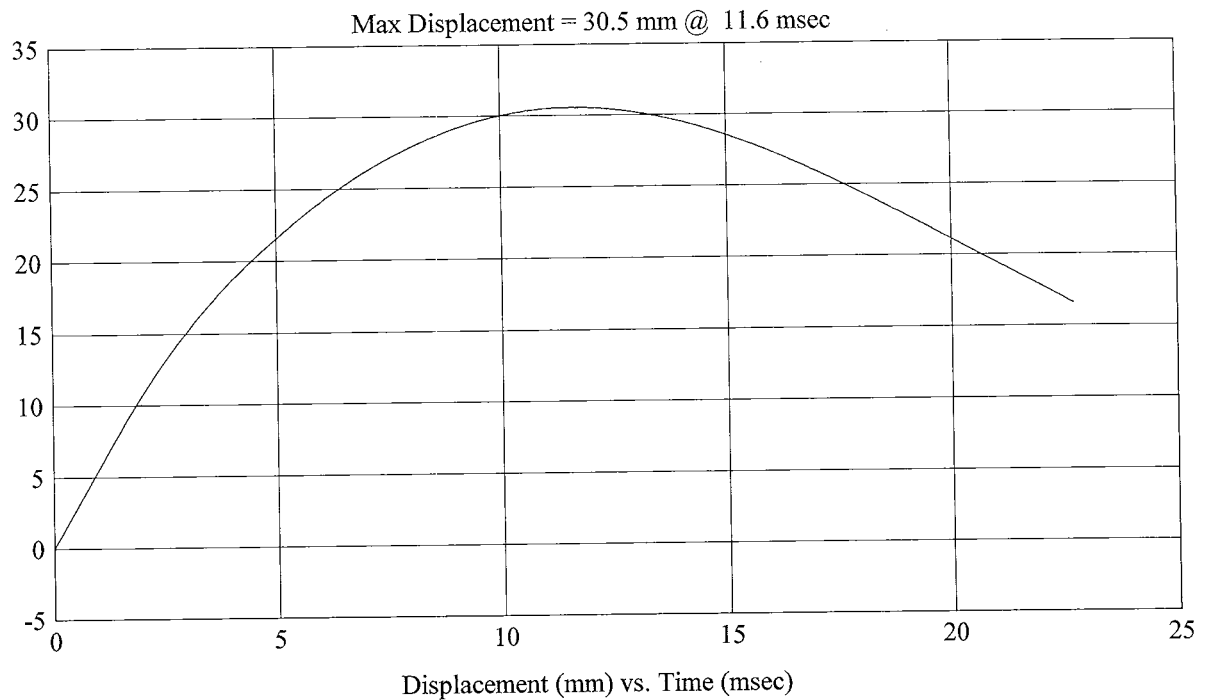
FMH
G06I7-001.7

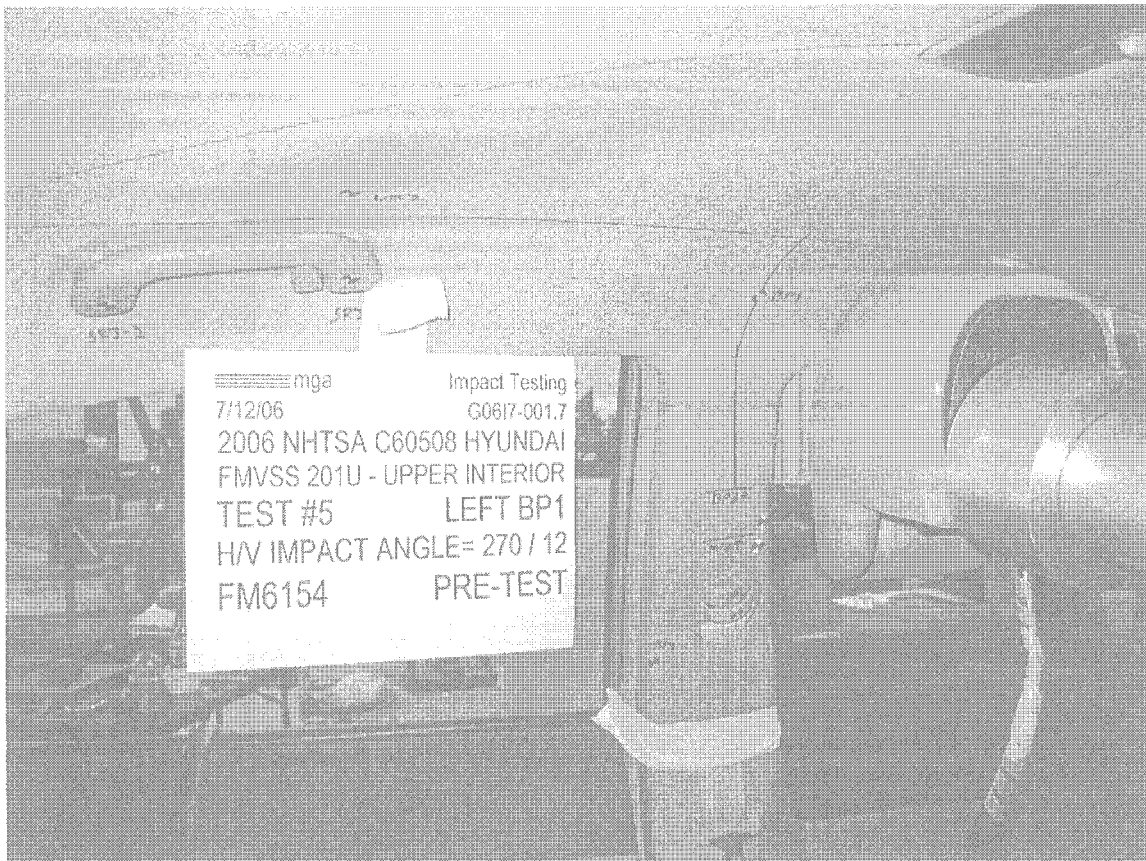
Customer: NHTSA
Test # 7
FM6156
Additional Desc: N/A

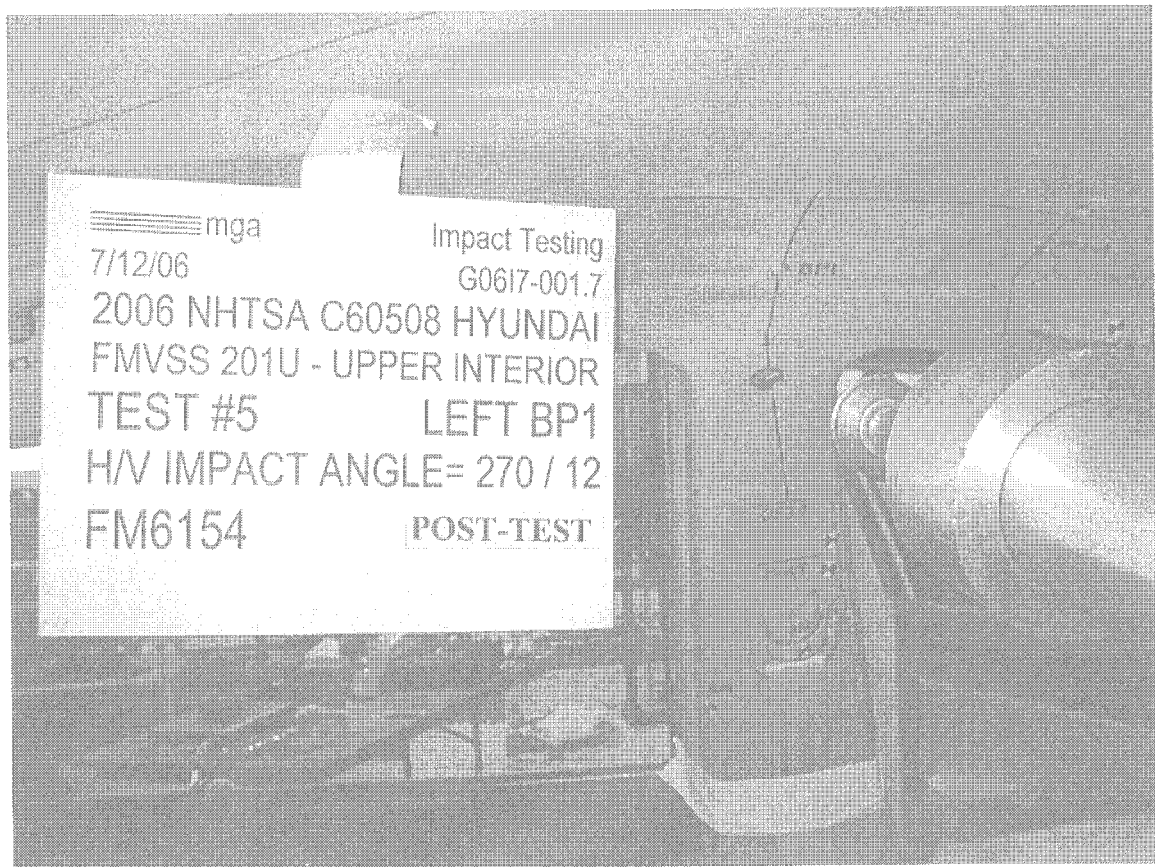
Vehicle Program : Hyundai
Test Date: 7/13/06

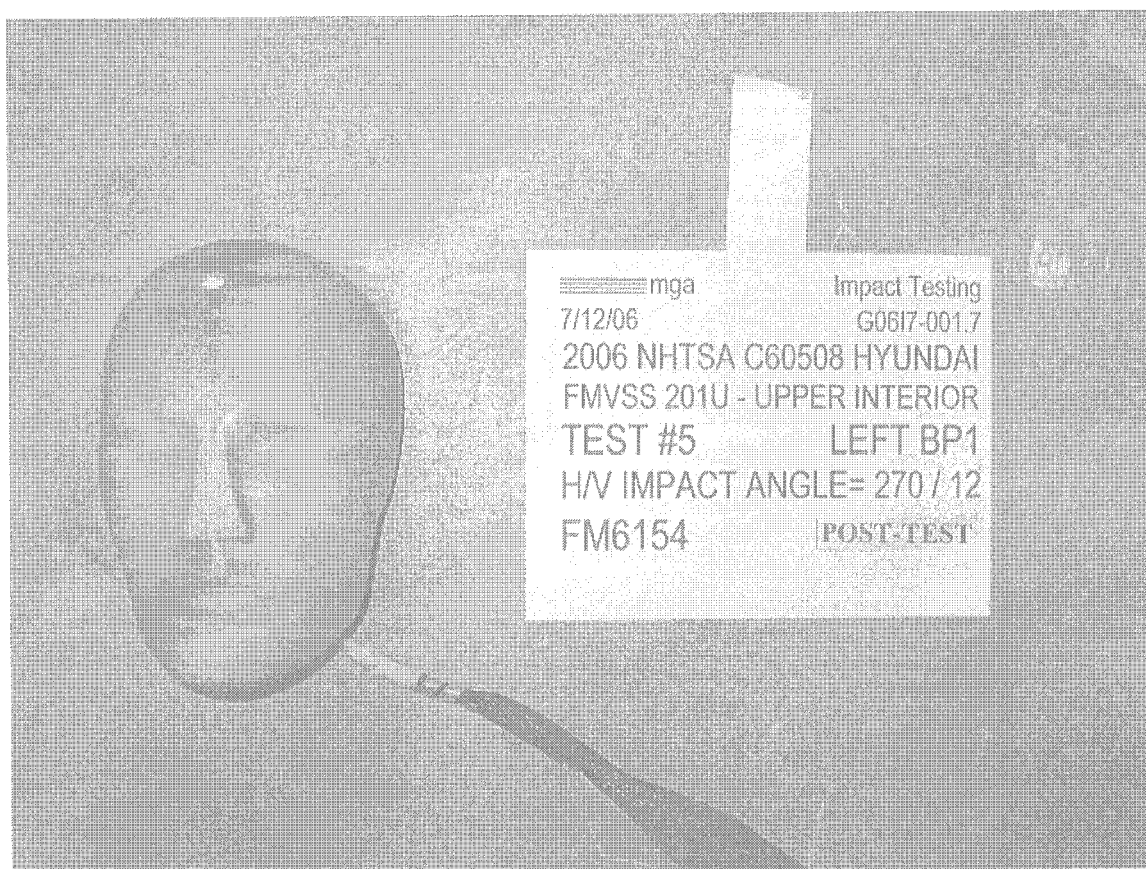
Model Year: 2006
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 158/45

HIC(d) = 340, HIC = 230, Delta T = 13 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#5

Target (Vehicle Side): BP1Left

Temperature:24C

MGA Test Reference No.:FM6154

Humidity:54%

Approach Horizontal Angles:270°

Time of Test:5:00 PM

Approach Vertical Angles:12°

FMH Serial No:[039]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
454	381	7.1	18.9	50	0

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J13753	-103.6	1.54	1.54
Y	6	J22700	94.4	1.53	1.53
Z	7	J32734	95.5	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Cover dislodged.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

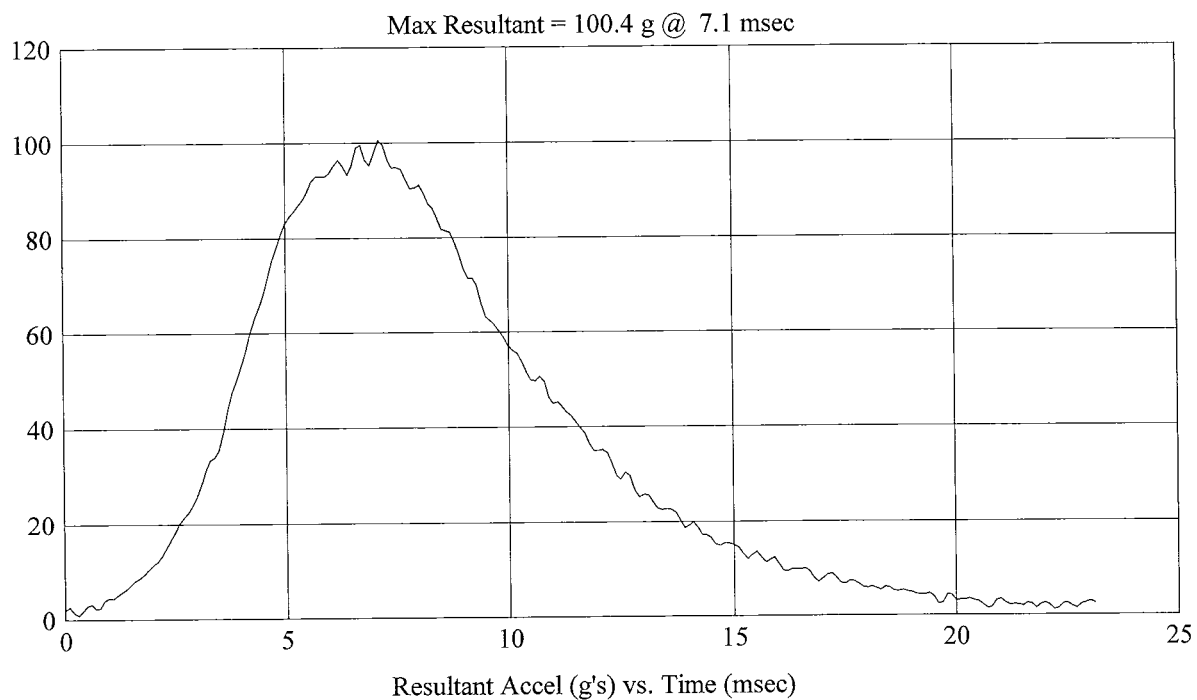
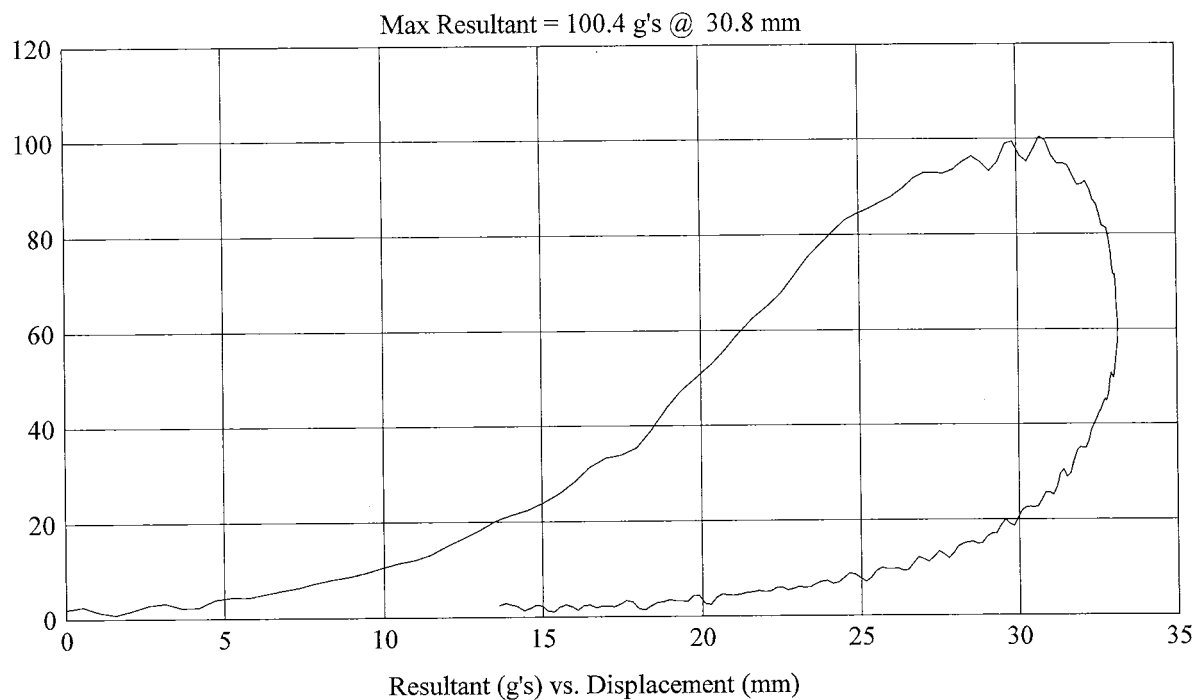
FMH
G06I7-001.7

Customer: NHTSA
Test # 5
FM6154
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: BP1
Vehicle Side: Left
Horz/Vert Angle: 270/12

HIC(d) = 454, HIC = 381, Delta T = 7.1 msec



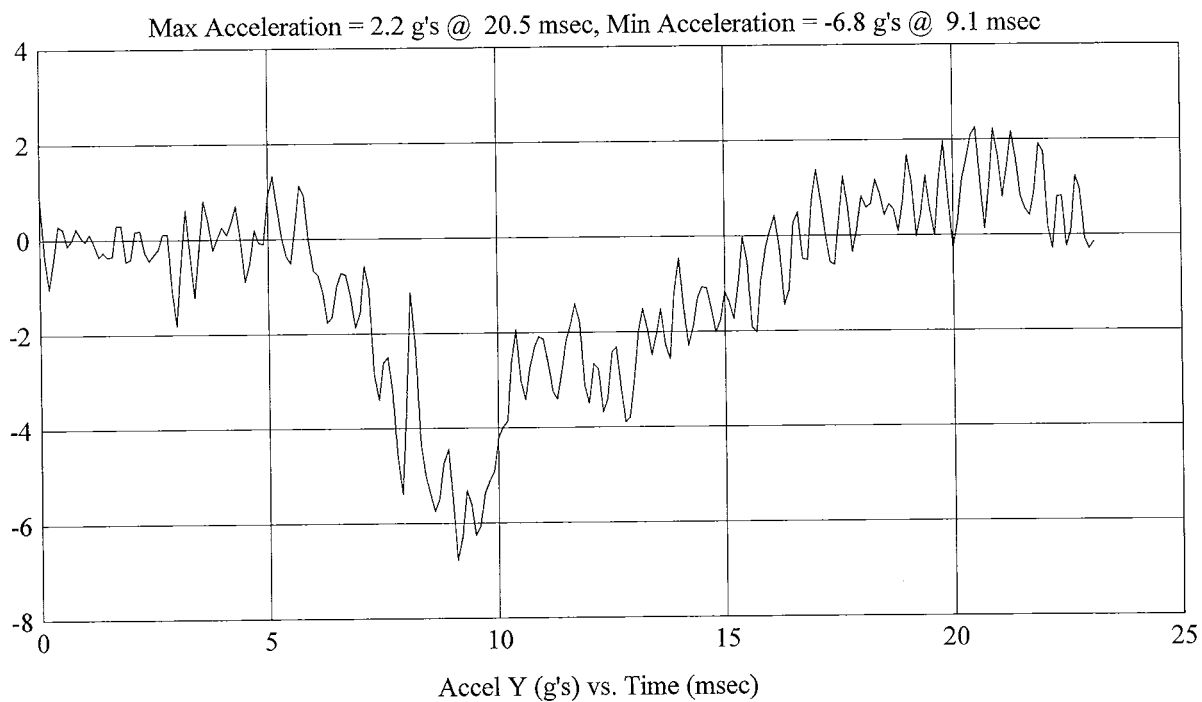
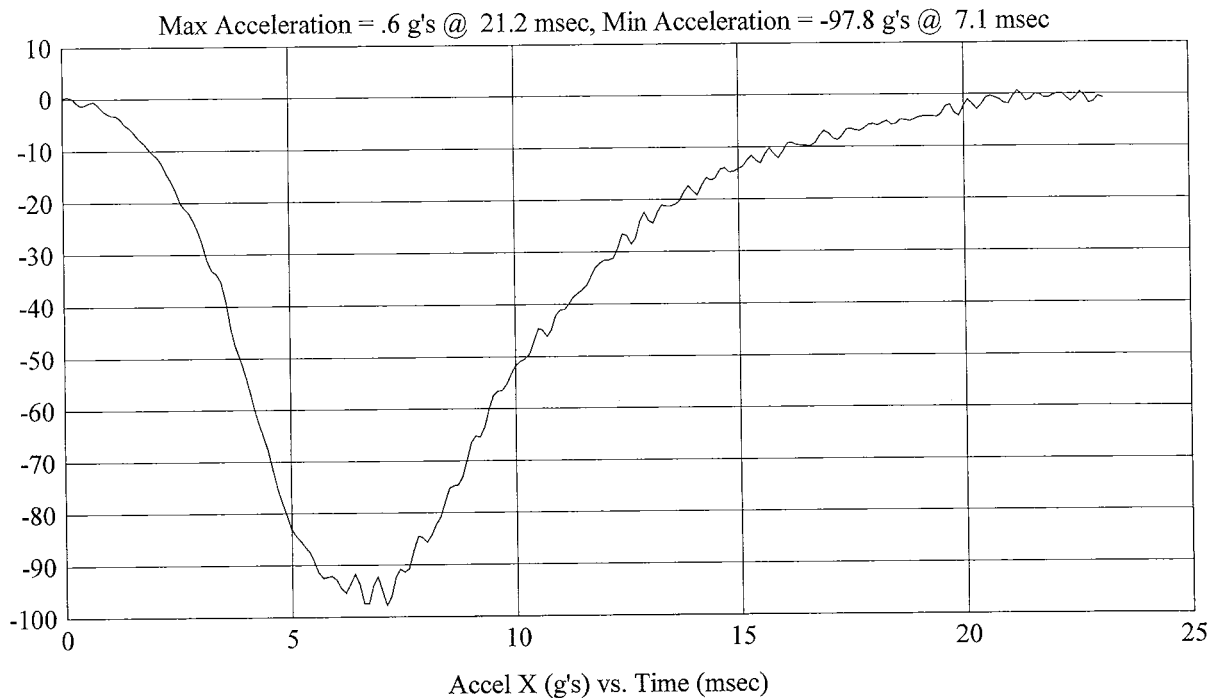
FMH
G06I7-001.7

Customer: NHTSA
Test # 5
FM6154
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: BP1
Vehicle Side: Left
Horz/Vert Angle: 270/12

HIC(d) = 454, HIC = 381, Delta T = 7.1 msec



FMH
G0617-001.7

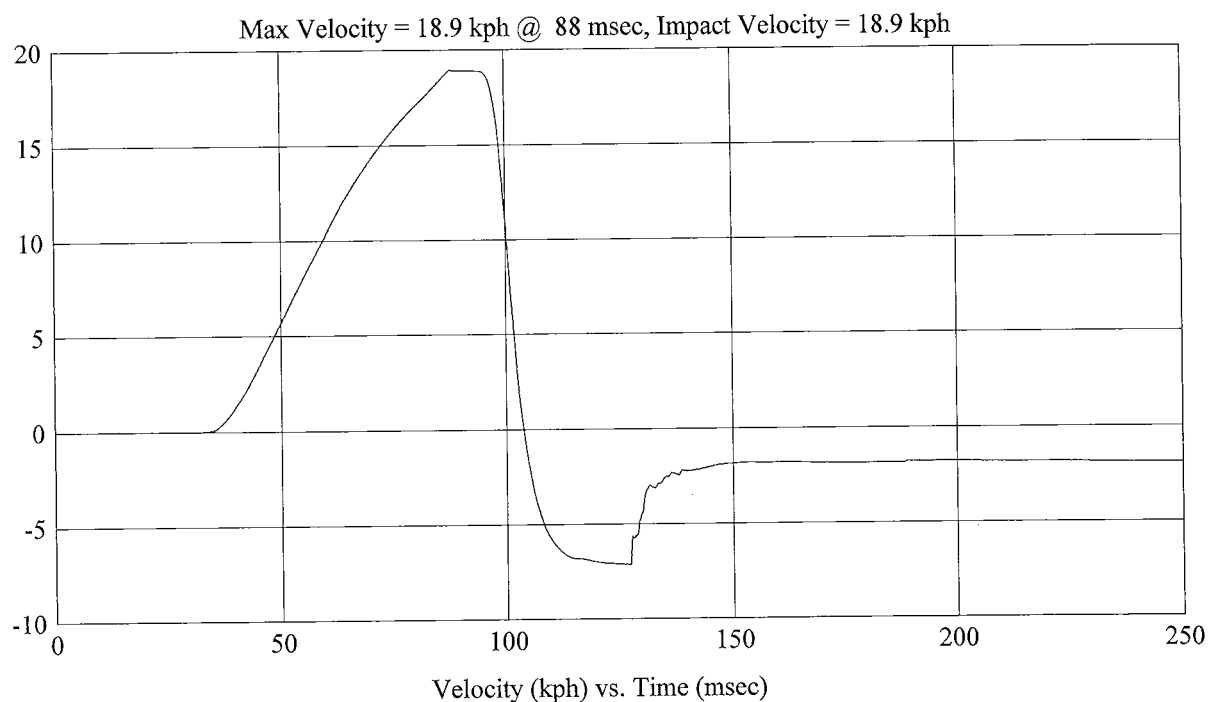
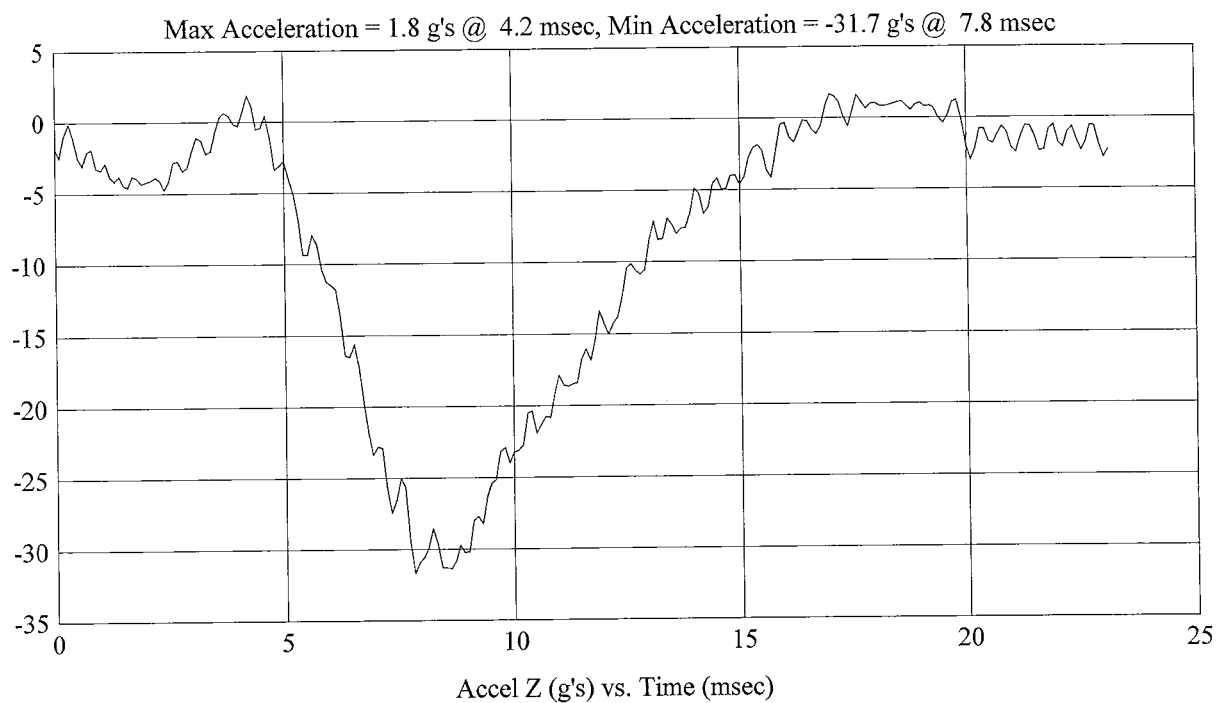
Customer: NHTSA
Test # 5
FM6154
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: BP1
Vehicle Side: Left
Horz/Vert Angle: 270/12

HIC(d) = 454, HIC = 381, Delta T = 7.1 msec



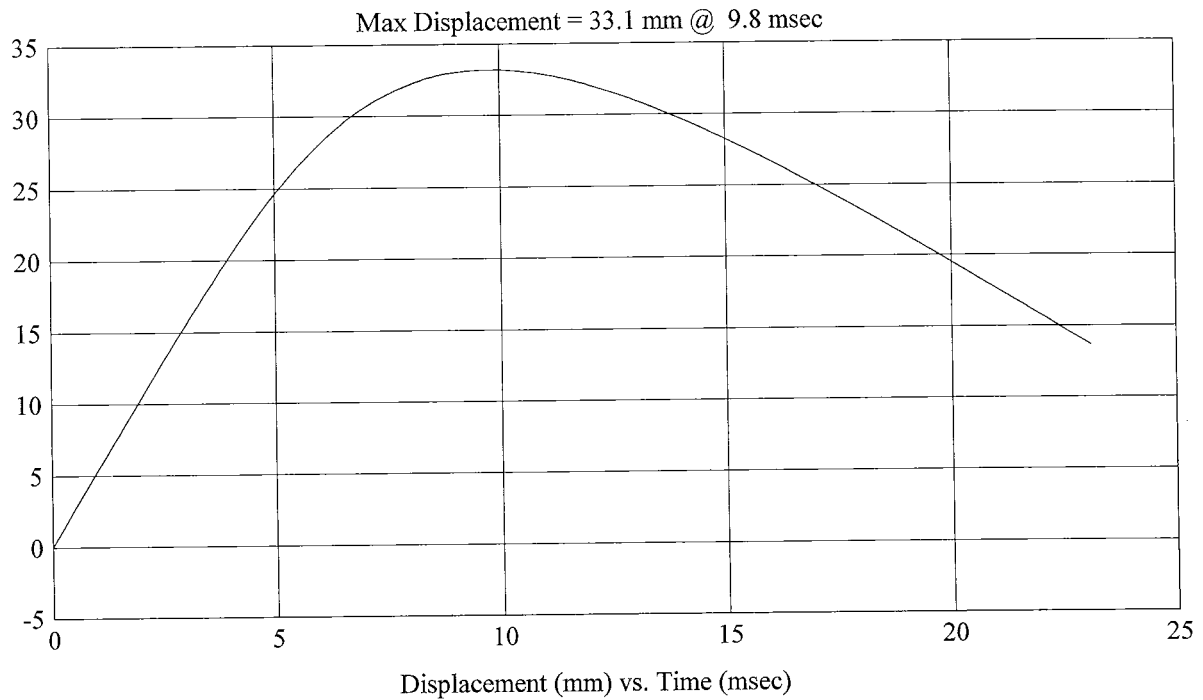
FMH
G06I7-001.7

Customer: NHTSA
Test # 5
FM6154
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

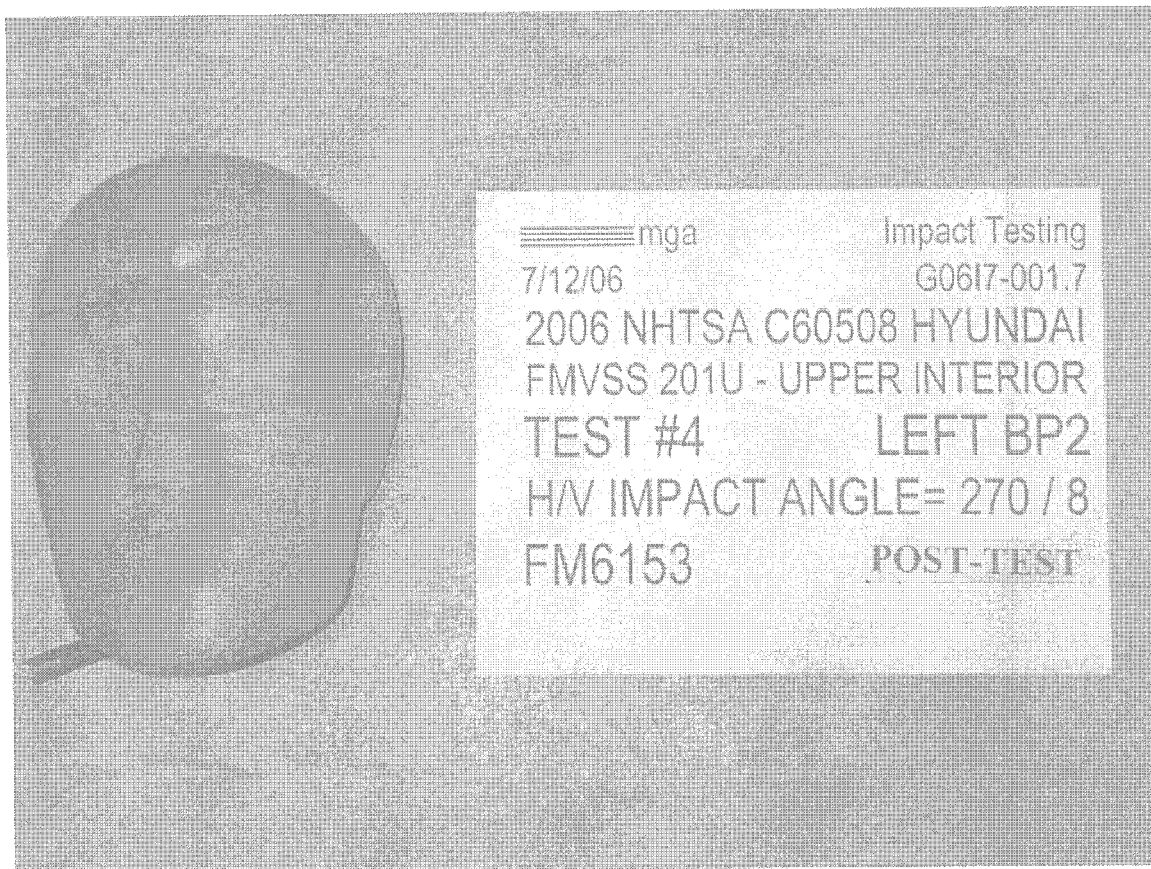
Model Year: 2006
Target: BP1
Vehicle Side: Left
Horz/Vert Angle: 270/12

HIC(d) = 454, HIC = 381, Delta T = 7.1 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#4

Target (Vehicle Side): BP2Left

Temperature:24C

MGA Test Reference No.:FM6153

Humidity:56%

Approach Horizontal Angles:270°

Time of Test:3:30 PM

Approach Vertical Angles:8°

FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
552	511	6.7	24.6	16	5 Left

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108.8	1.55	1.55
Y	6	J36193	102.7	1.54	1.53
Z	7	J36353	97.2	1.47	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

FMH
G06I7-001.7

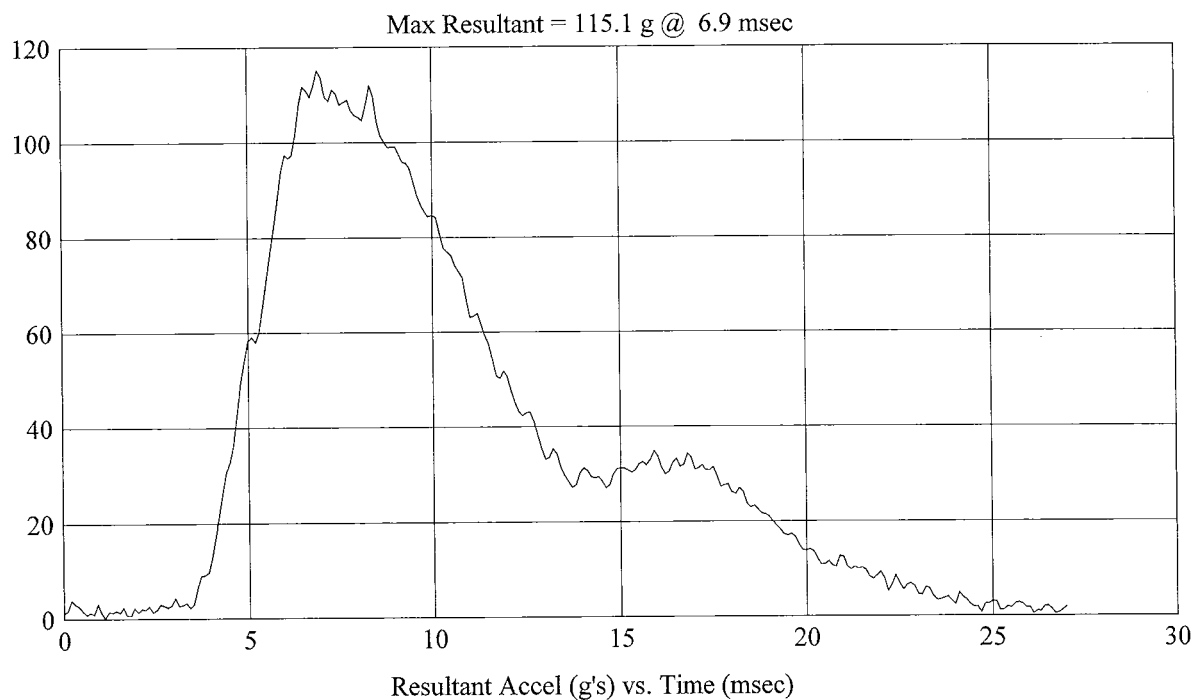
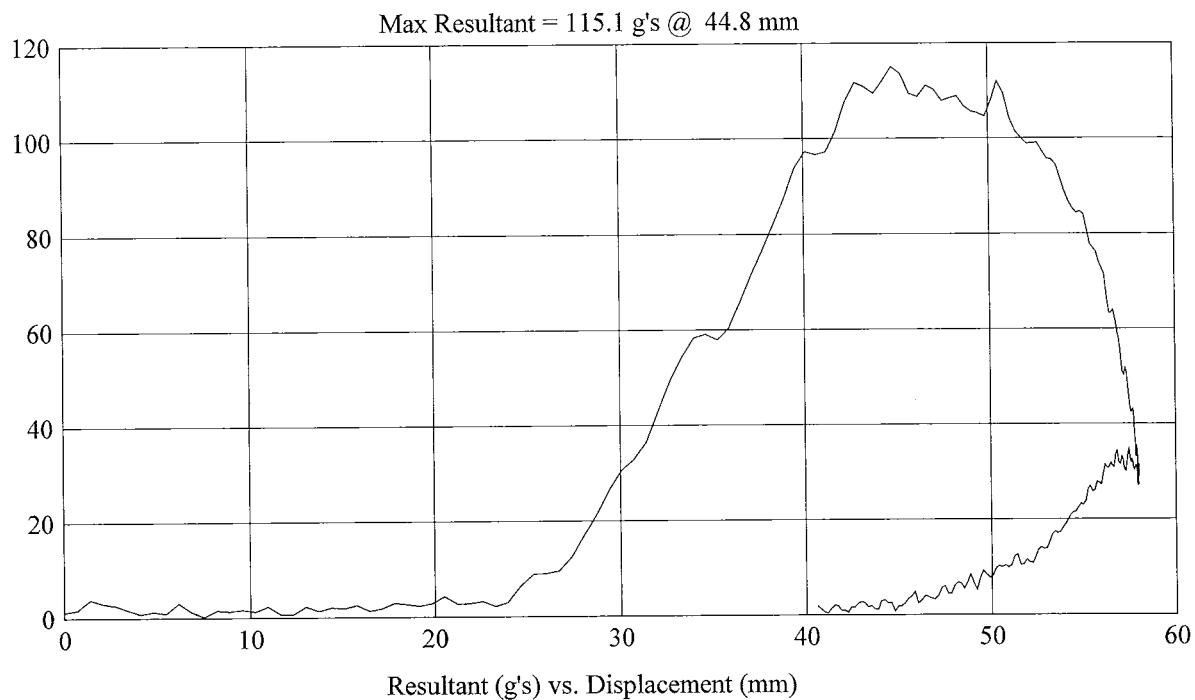
Customer: NHTSA
Test # 4
FM6153
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: BP2
Vehicle Side: Left
Horz/Vert Angle: 270/8

HIC(d) = 552, HIC = 511, Delta T = 6.7 msec



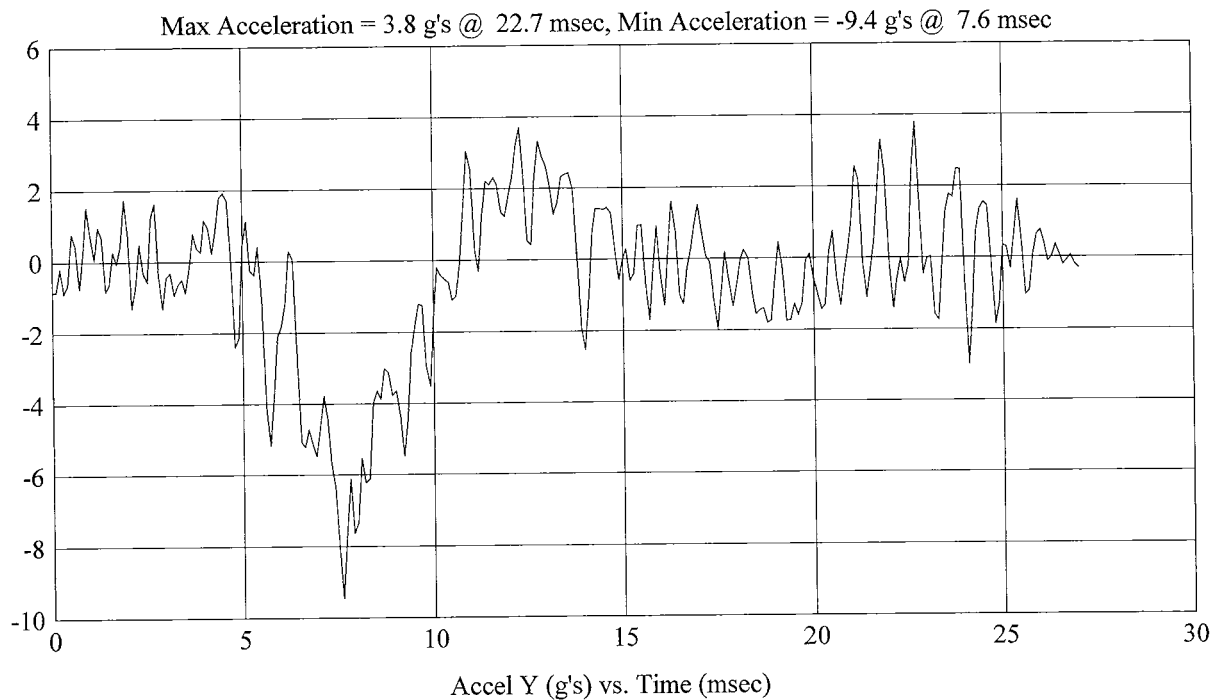
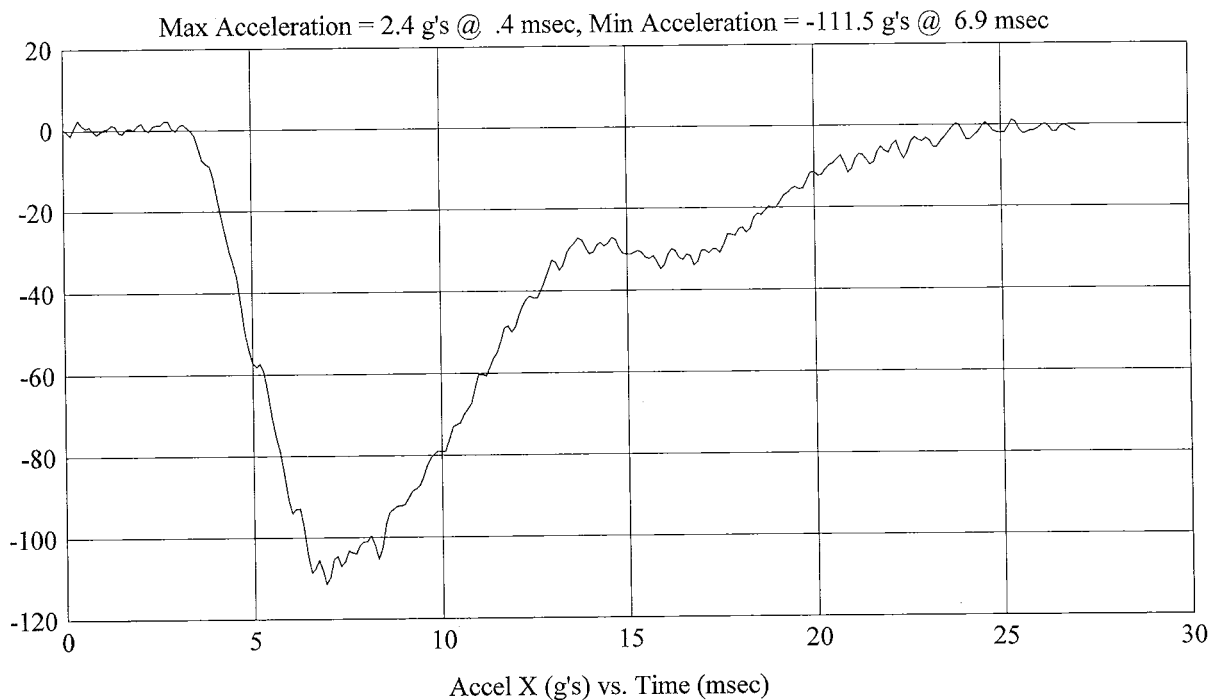
FMH
G06I7-001.7

Customer: NHTSA
Test # 4
FM6153
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: BP2
Vehicle Side: Left
Horz/Vert Angle: 270/8

HIC(d) = 552, HIC = 511, Delta T = 6.7 msec



FMH
G06I7-001.7

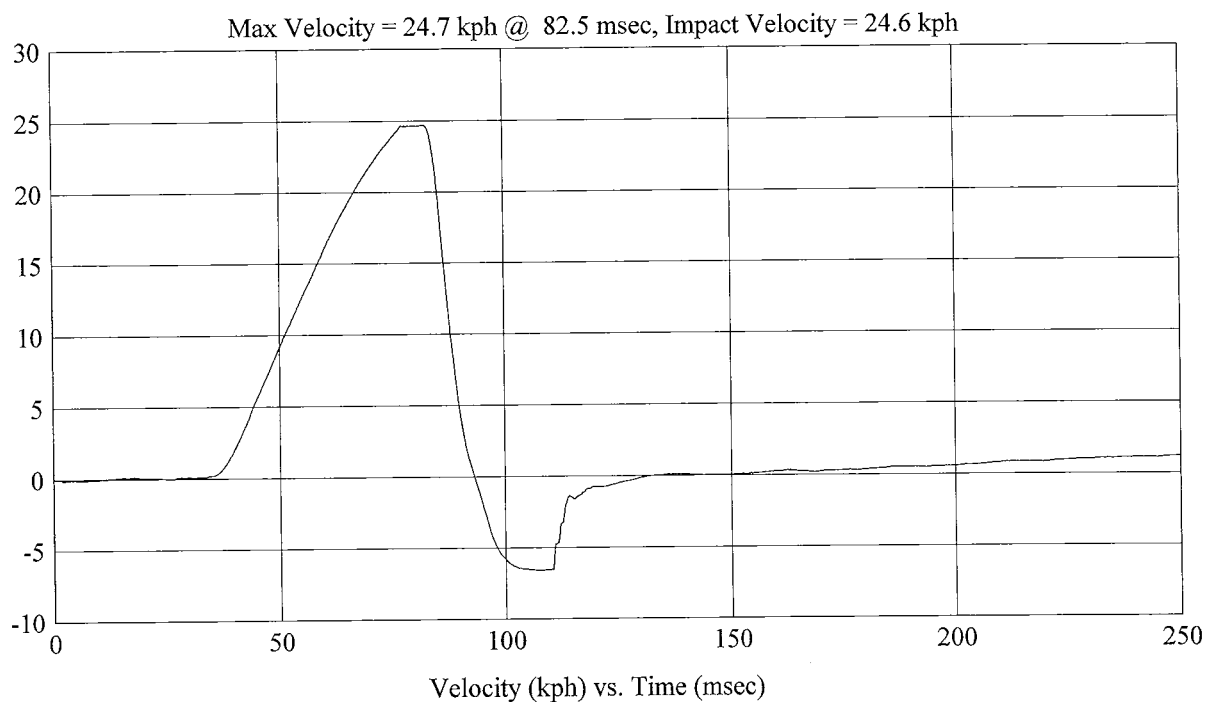
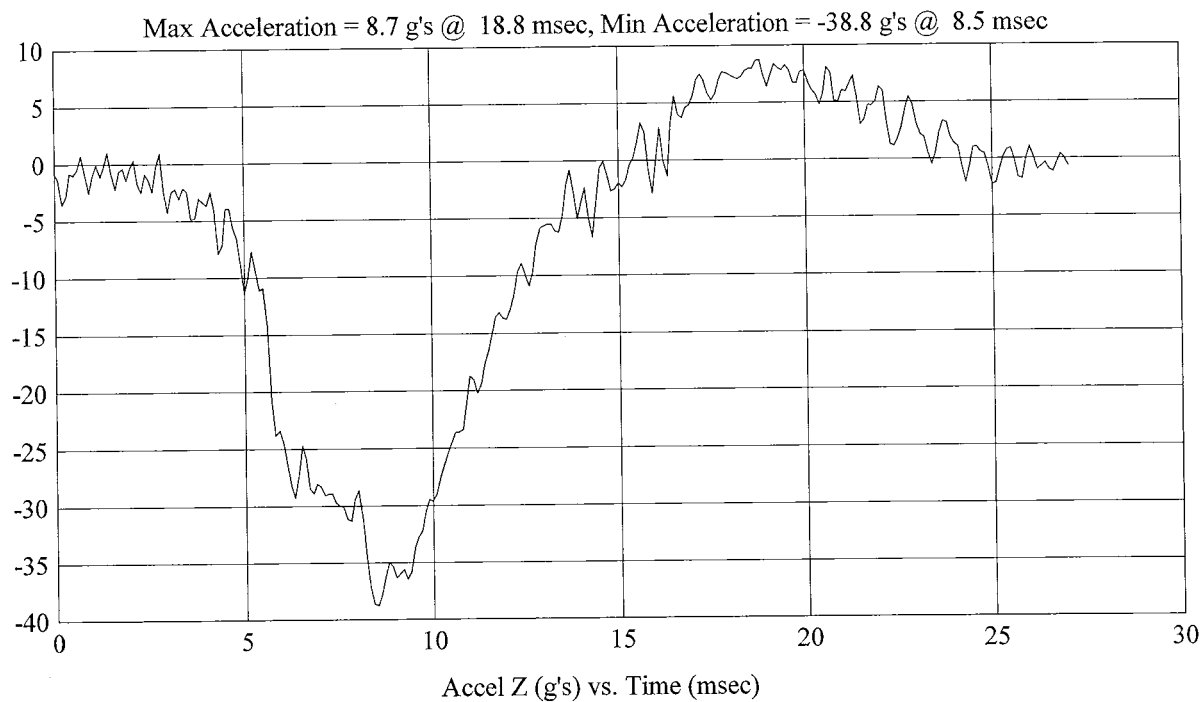
Customer: NHTSA
Test # 4
FM6153
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: BP2
Vehicle Side: Left
Horz/Vert Angle: 270/8

HIC(d) = 552, HIC = 511, Delta T = 6.7 msec



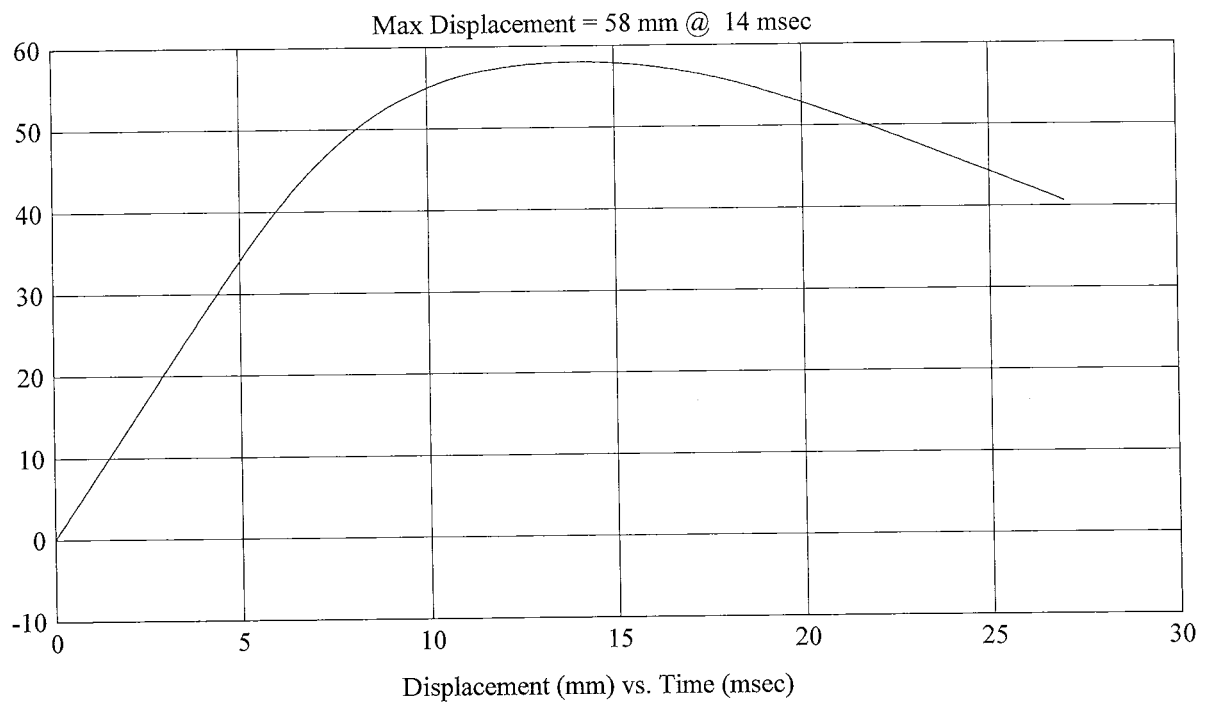
FMH
G06I7-001.7

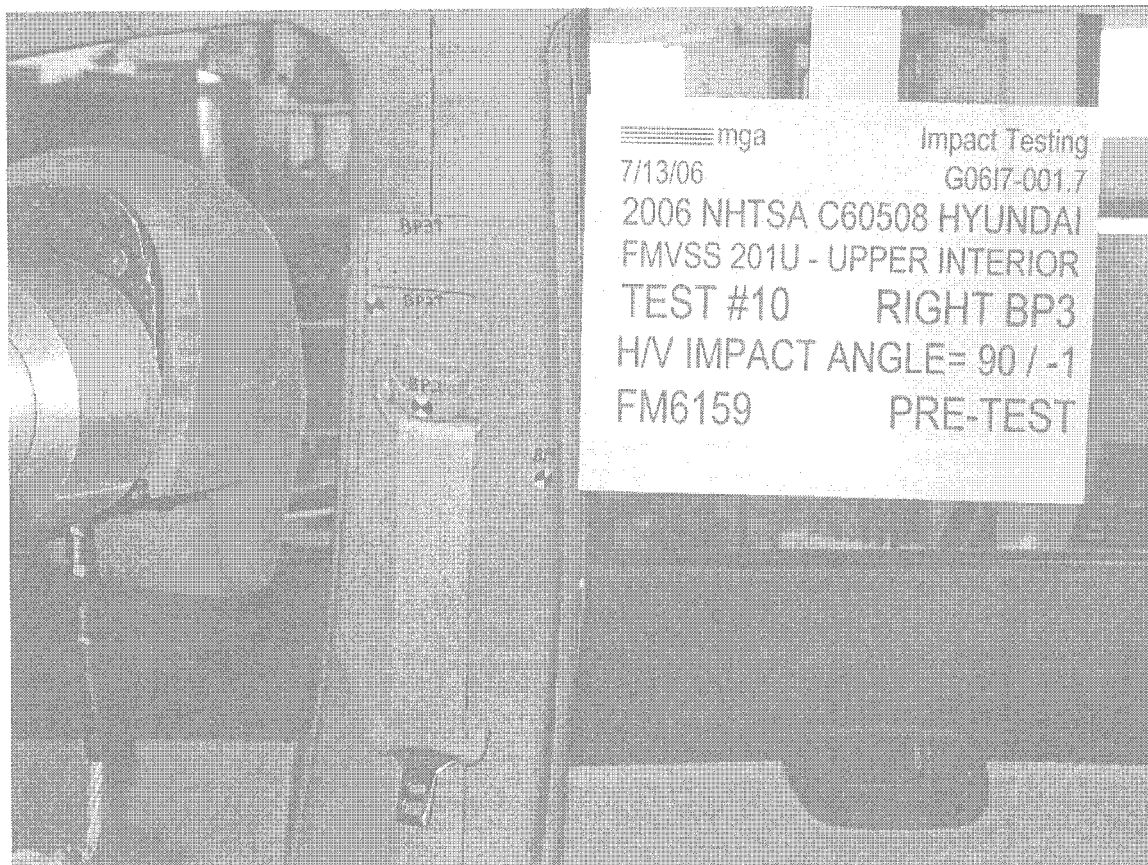
Customer: NHTSA
Test # 4
FM6153
Additional Desc: N/A

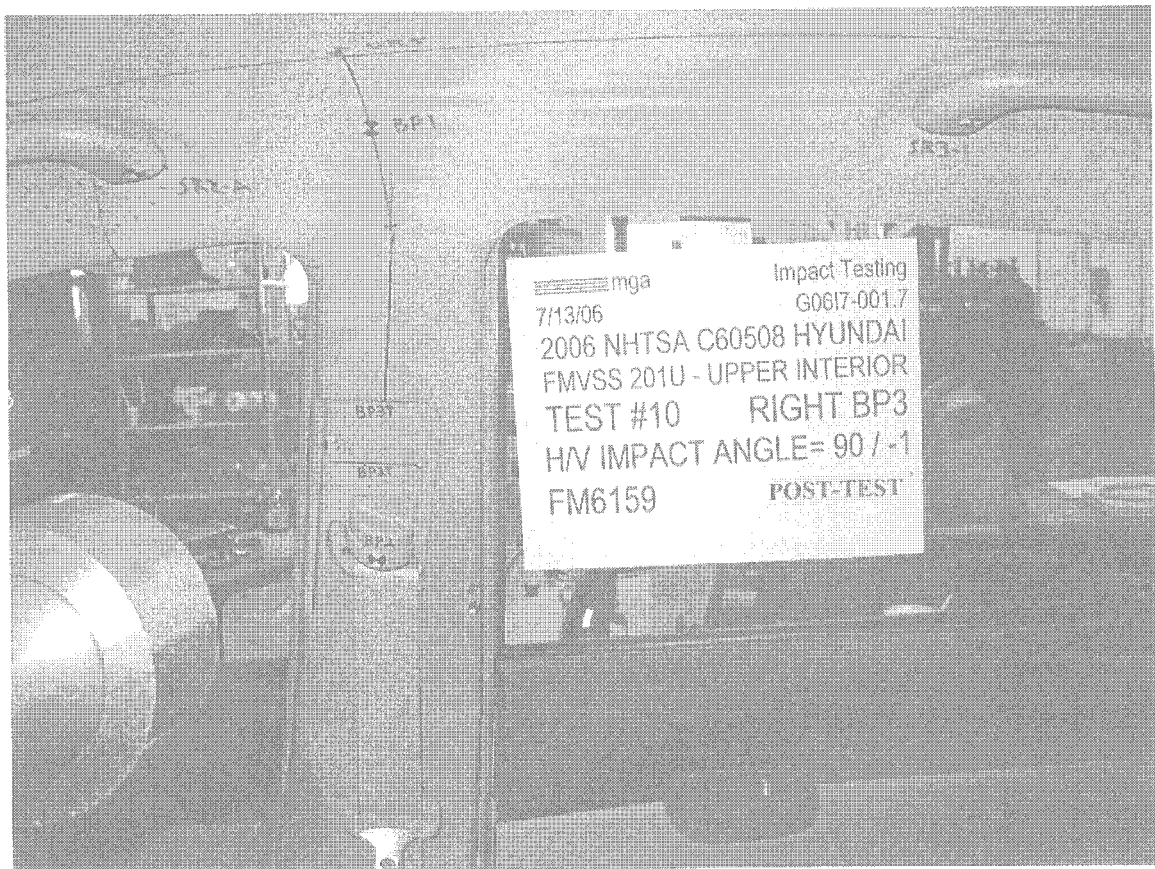
Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: BP2
Vehicle Side: Left
Horz/Vert Angle: 270/8

HIC(d) = 552, HIC = 511, Delta T = 6.7 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#10

Target (Vehicle Side): BP3Right

Temperature:22C

MGA Test Reference No.:FM6159

Humidity:45%

Approach Horizontal Angles:90°

Time of Test:3:00 PM

Approach Vertical Angles:-1°

FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
796	835	5.1	23.4	27	11 Right

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108.8	1.55	1.54
Y	6	J36193	102.7	1.53	1.54
Z	7	J36353	97.2	1.45	1.46

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06

*Only necessary for NHTSA (Government) Compliance testing.

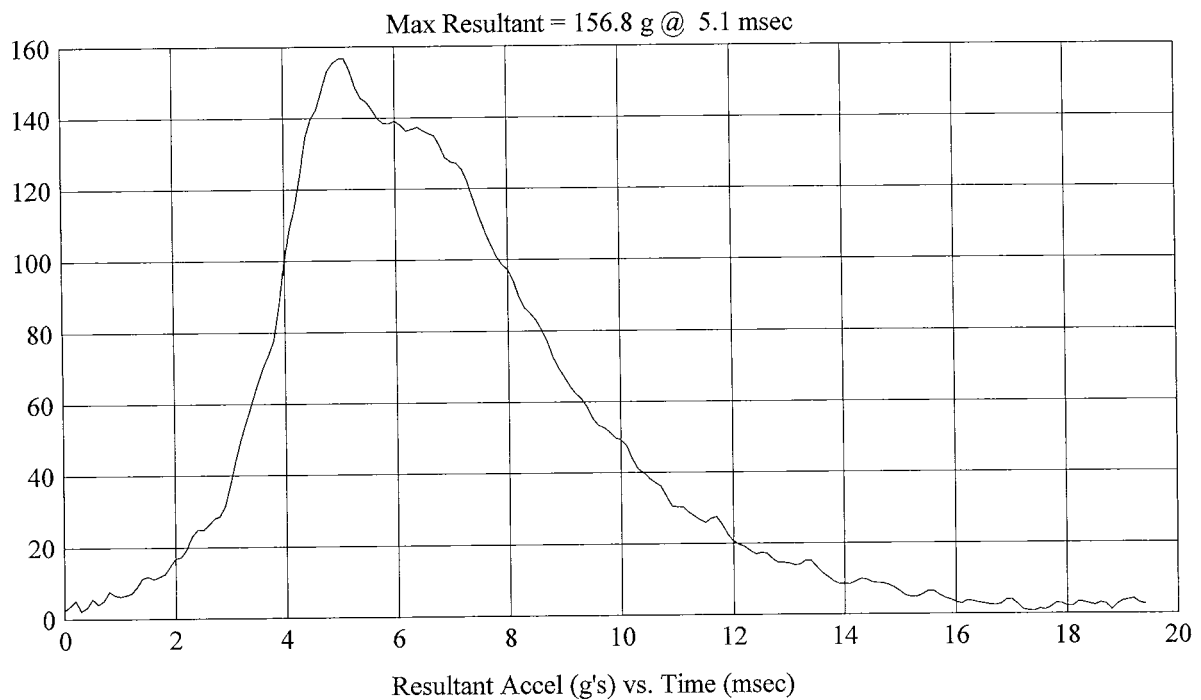
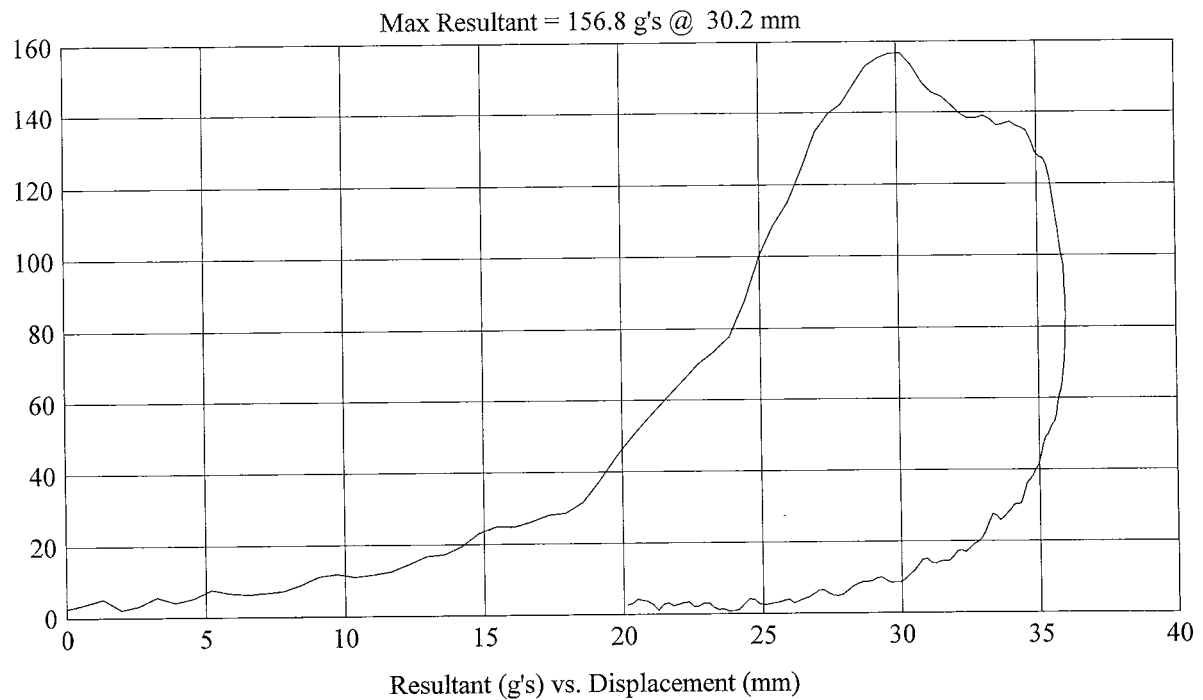
FMH
G06I7-001.7

Customer: NHTSA
Test # 10
FM6159
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: BP3
Vehicle Side: Right
Horz/Vert Angle: 90/-1

HIC(d) = 796, HIC = 835, Delta T = 5.1 msec



FMH
G06I7-001.7

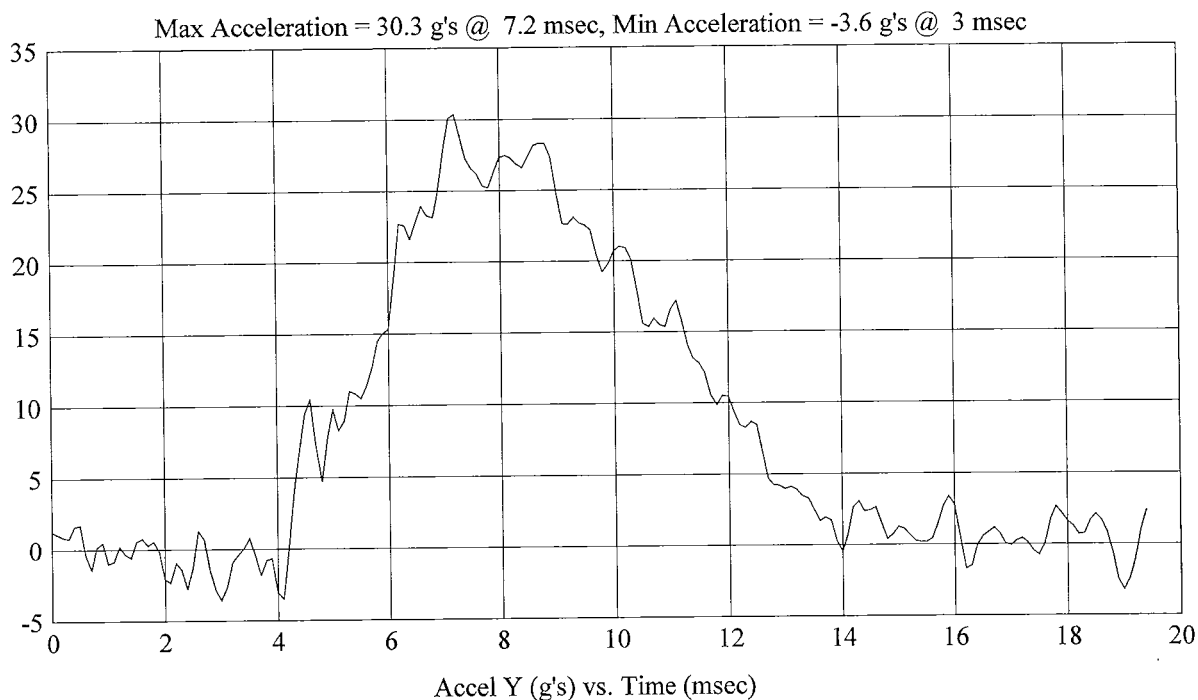
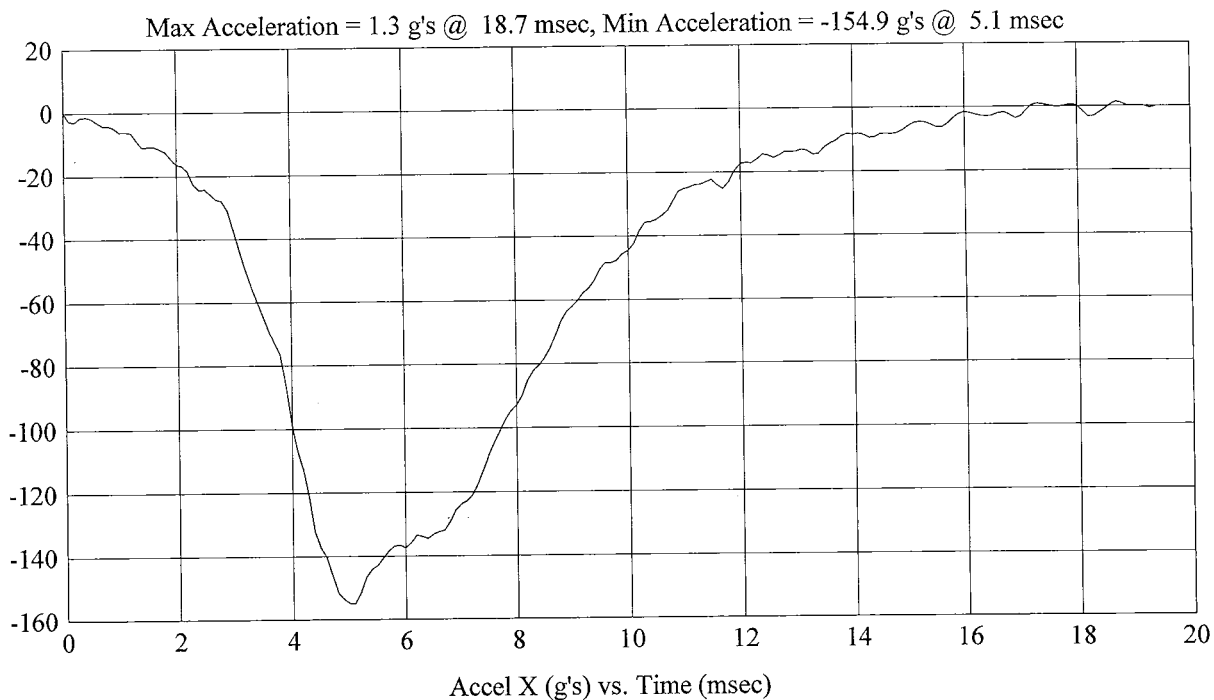
Customer: NHTSA
Test # 10
FM6159
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: BP3
Vehicle Side: Right
Horz/Vert Angle: 90/-1

HIC(d) = 796, HIC = 835, Delta T = 5.1 msec



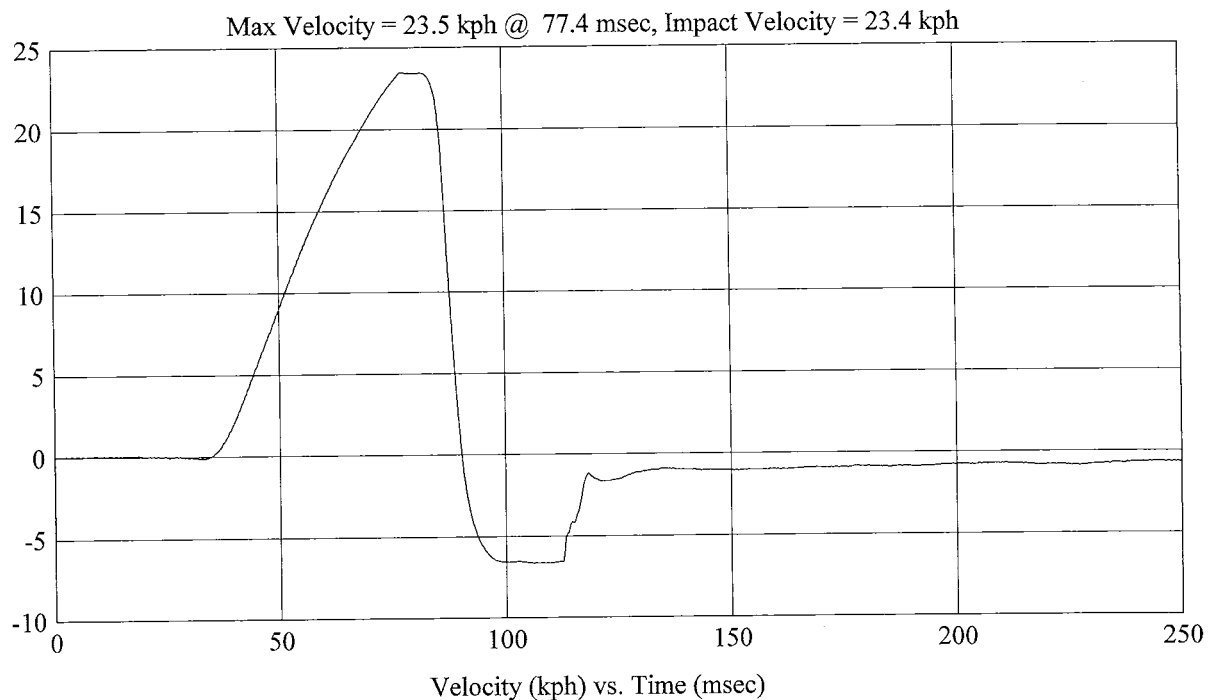
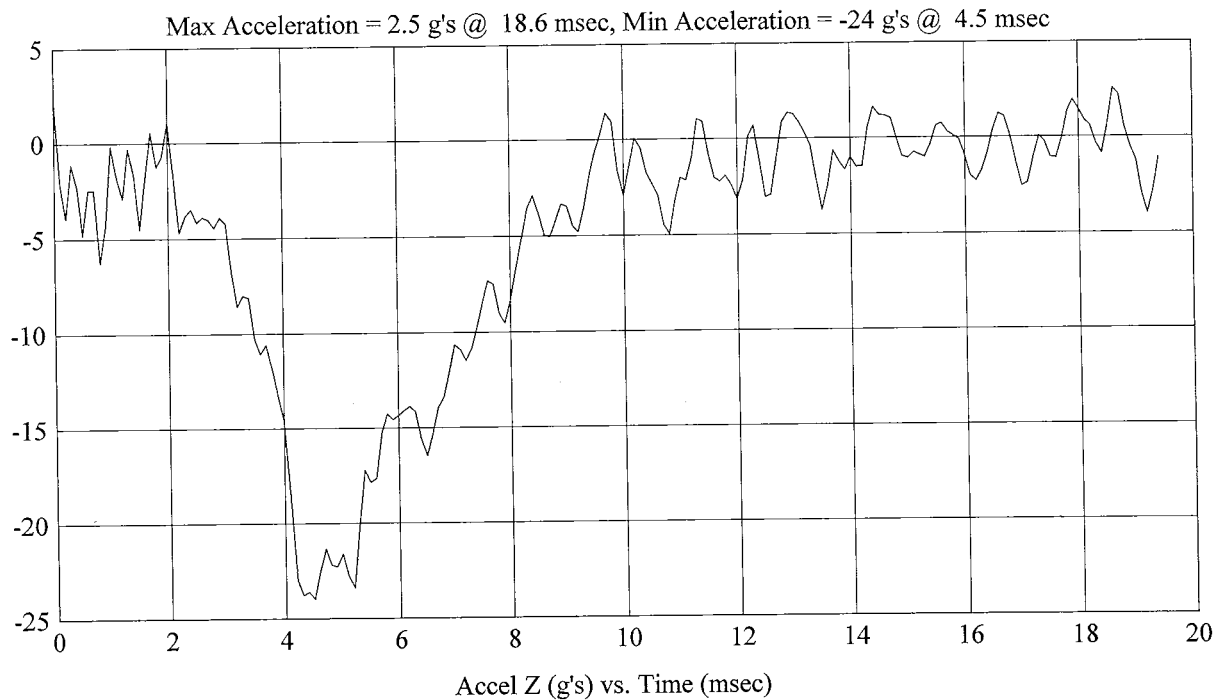
FMH
G06I7-001.7

Customer: NHTSA
Test # 10
FM6159
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: BP3
Vehicle Side: Right
Horz/Vert Angle: 90/-1

HIC(d) = 796, HIC = 835, Delta T = 5.1 msec



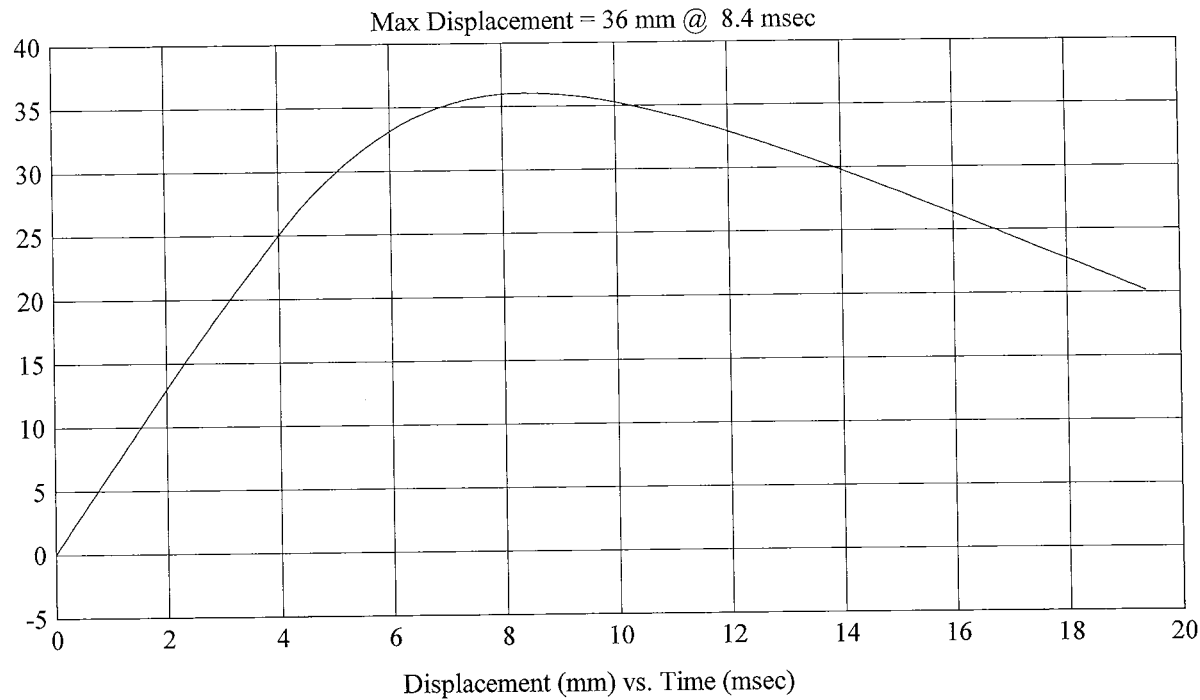
FMH
G06I7-001.7

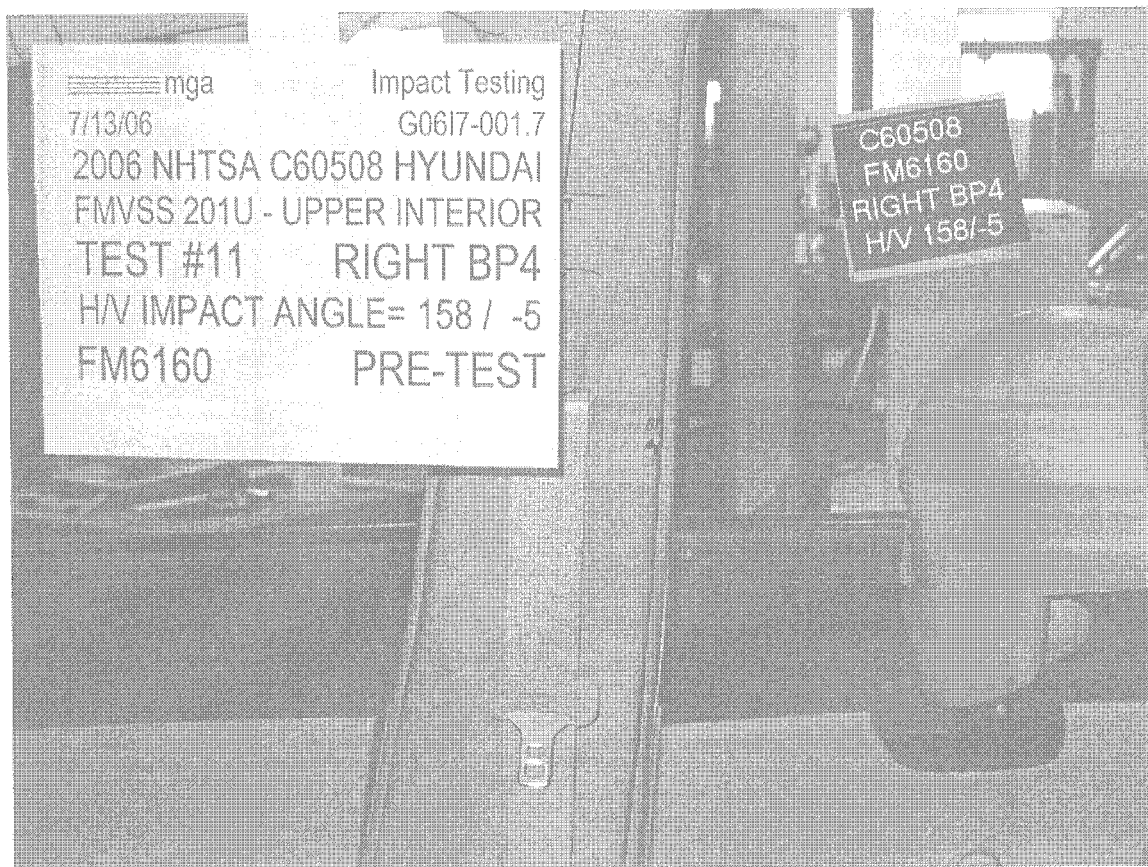
Customer: NHTSA
Test # 10
FM6159
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

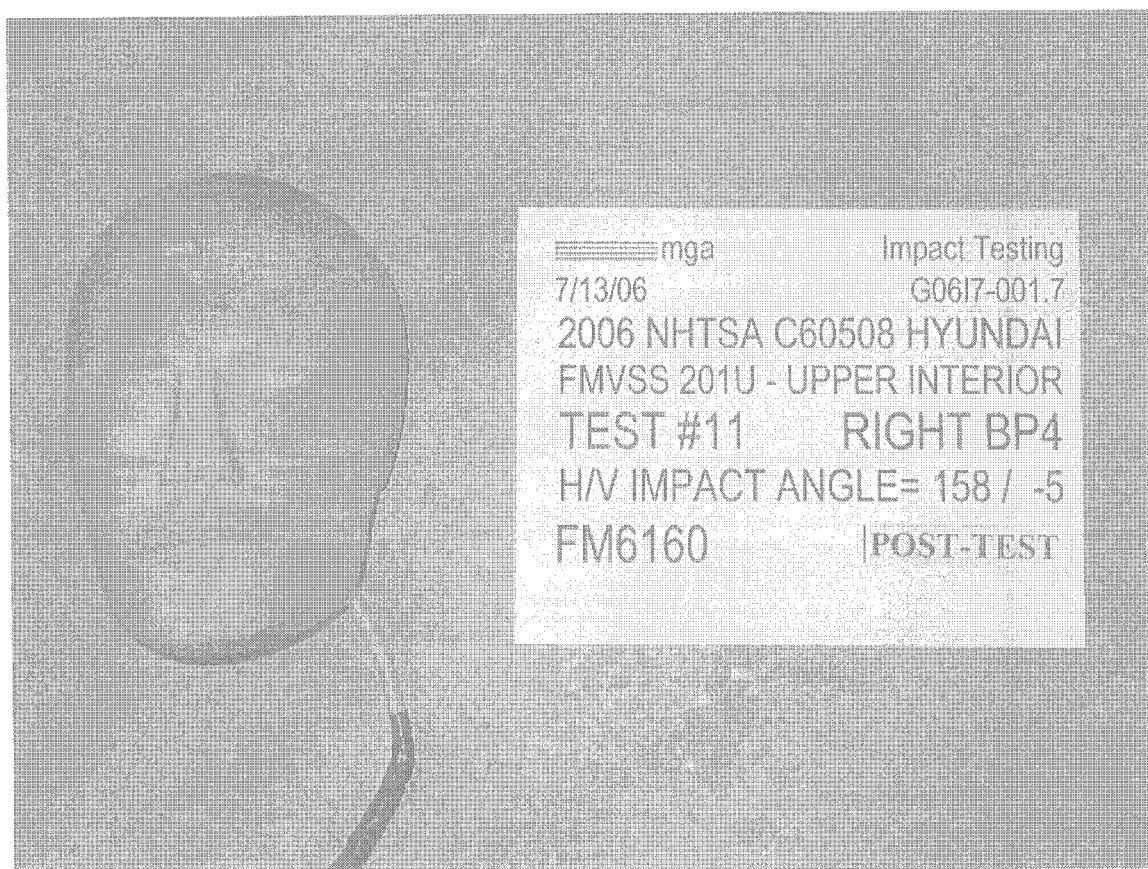
Model Year: 2006
Target: BP3
Vehicle Side: Right
Horz/Vert Angle: 90/-1

HIC(d) = 796, HIC = 835, Delta T = 5.1 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#11

Target (Vehicle Side): BP4Right

Temperature:22C

MGA Test Reference No.:FM6160

Humidity:45%

Approach Horizontal Angles:158°

Time of Test:3:30 PM

Approach Vertical Angles: -5°

FMH Serial No:[039]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
496	437	8.5	23.8	17	0

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J13753	-103.6	1.55	1.55
Y	6	J22700	94.4	1.53	1.53
Z	7	J32734	95.5	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Pillar creased.

Recorded By: Matt Kerr Approved By*: Deena A. Kalito Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

FMH
G06I7-001.7

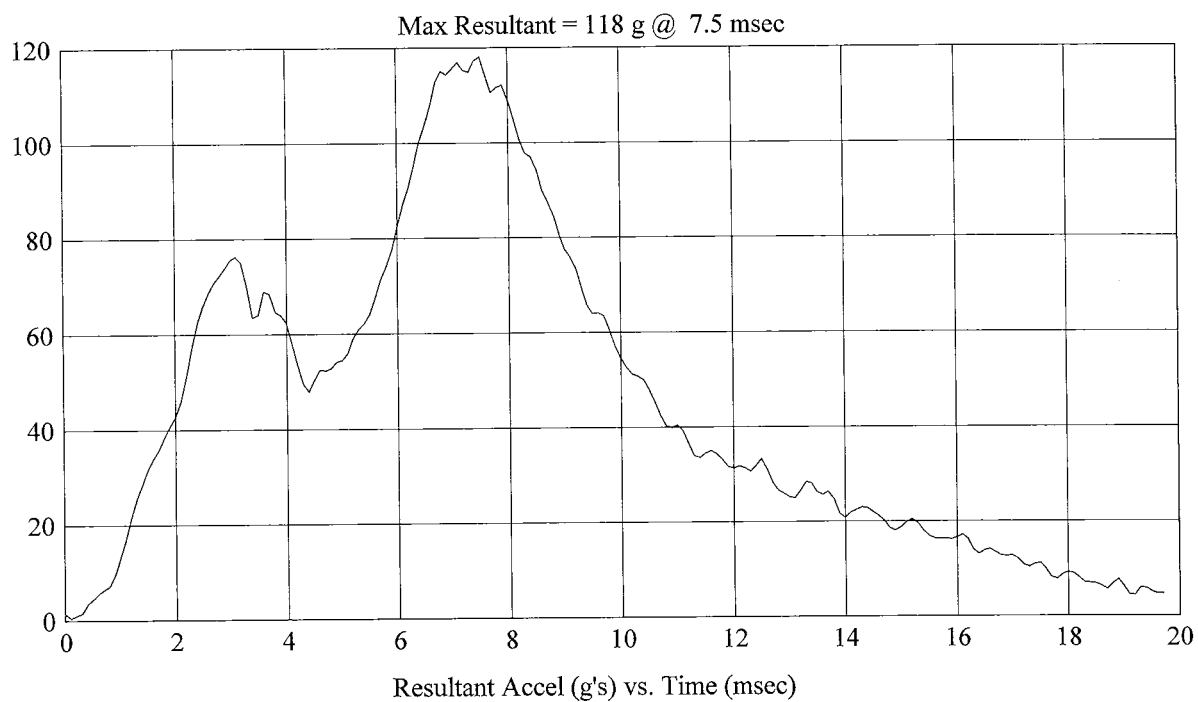
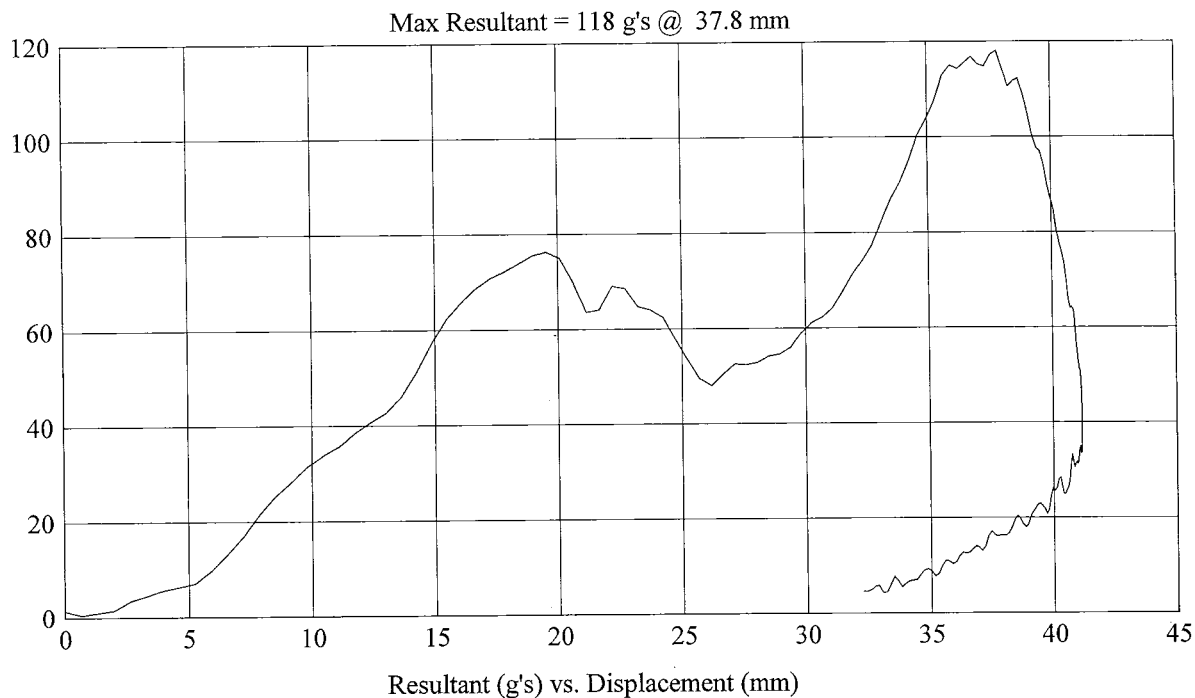
Customer: NHTSA
Test # 11
FM6160
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 158/-5

HIC(d) = 496, HIC = 437, Delta T = 8.5 msec



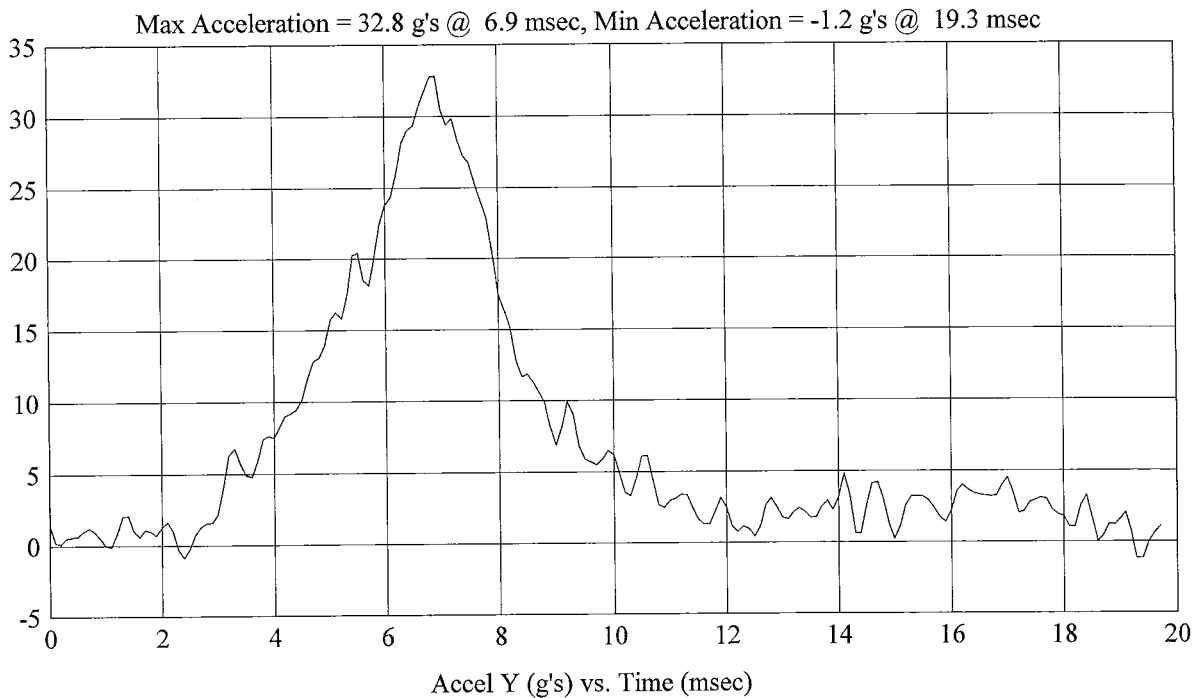
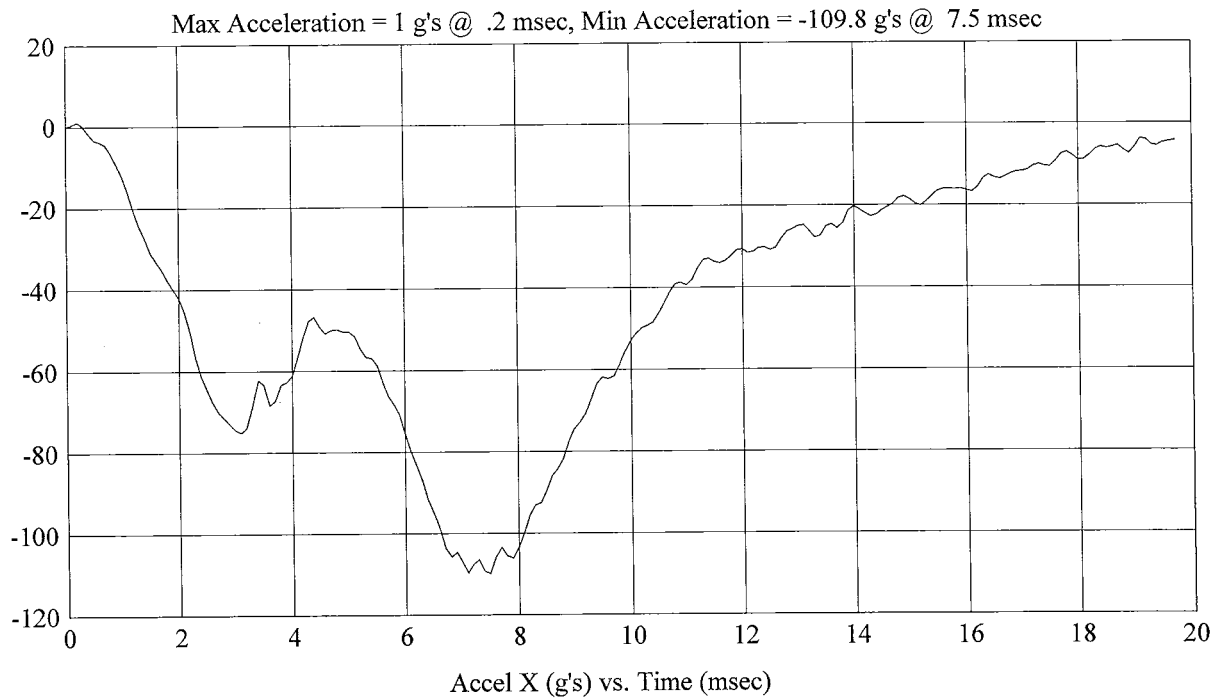
FMH
G06I7-001.7

Customer: NHTSA
Test # 11
FM6160
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 158/ -5

HIC(d) = 496, HIC = 437, Delta T = 8.5 msec



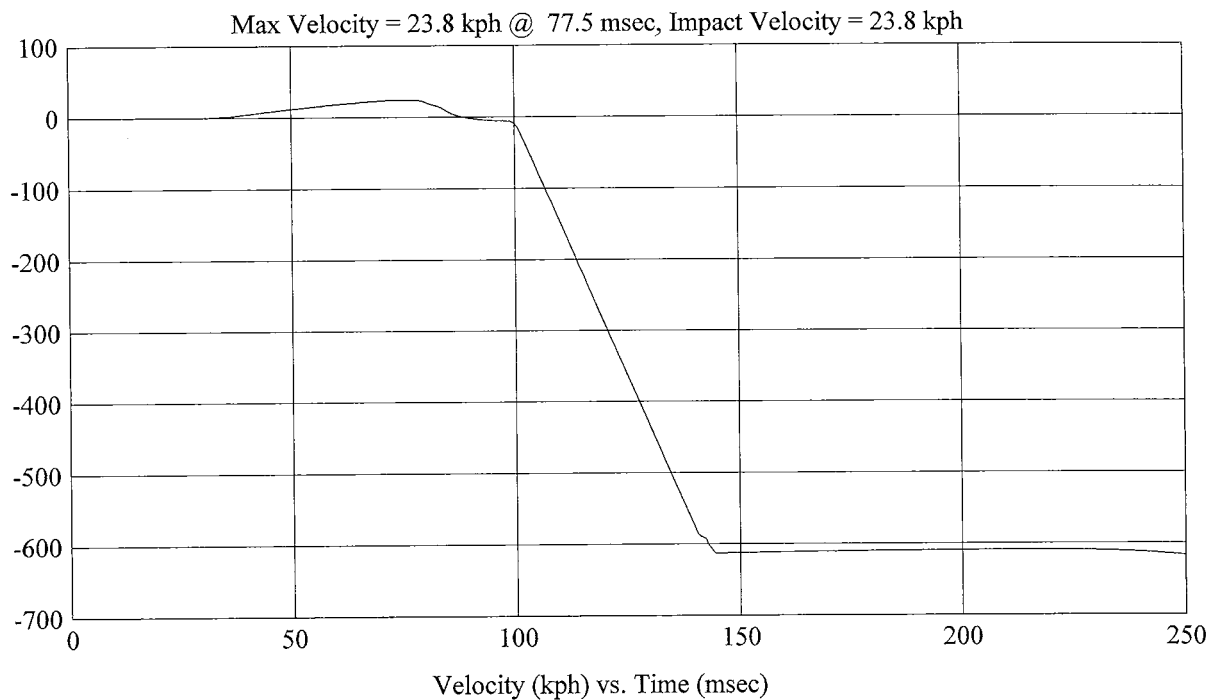
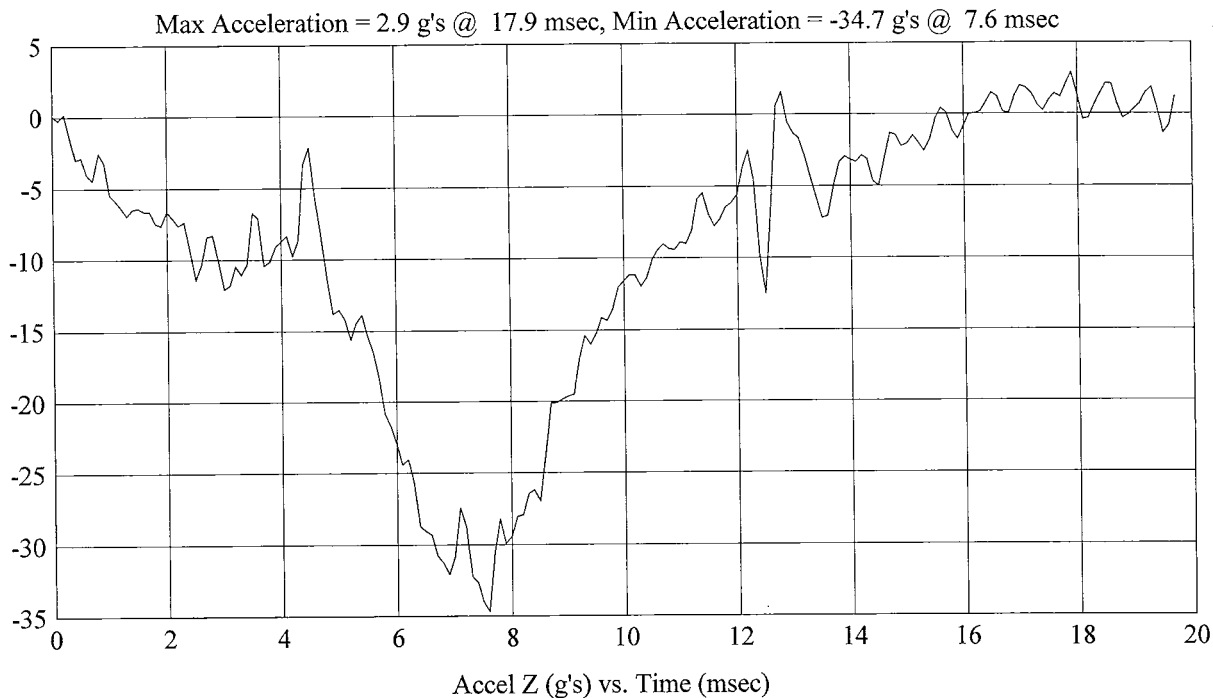
FMH
G06I7-001.7

Customer: NHTSA
Test # 11
FM6160
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 158/ -5

HIC(d) = 496, HIC = 437, Delta T = 8.5 msec



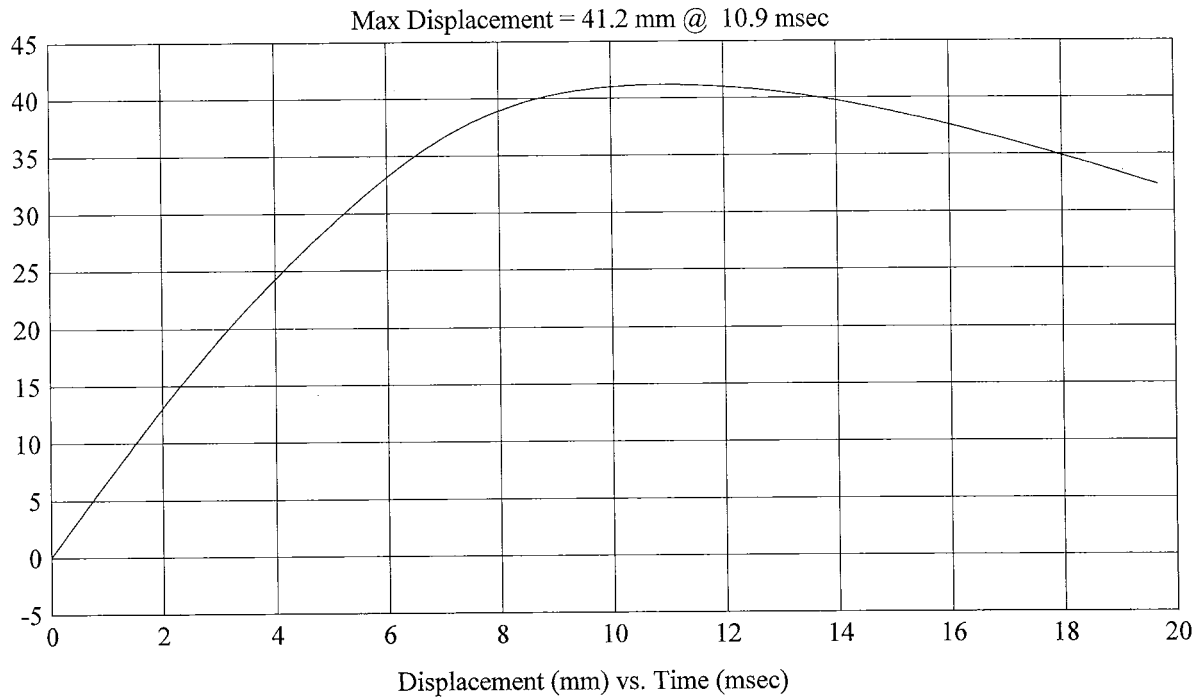
FMH
G06I7-001.7

Customer: NHTSA
Test # 11
FM6160
Additional Desc: N/A

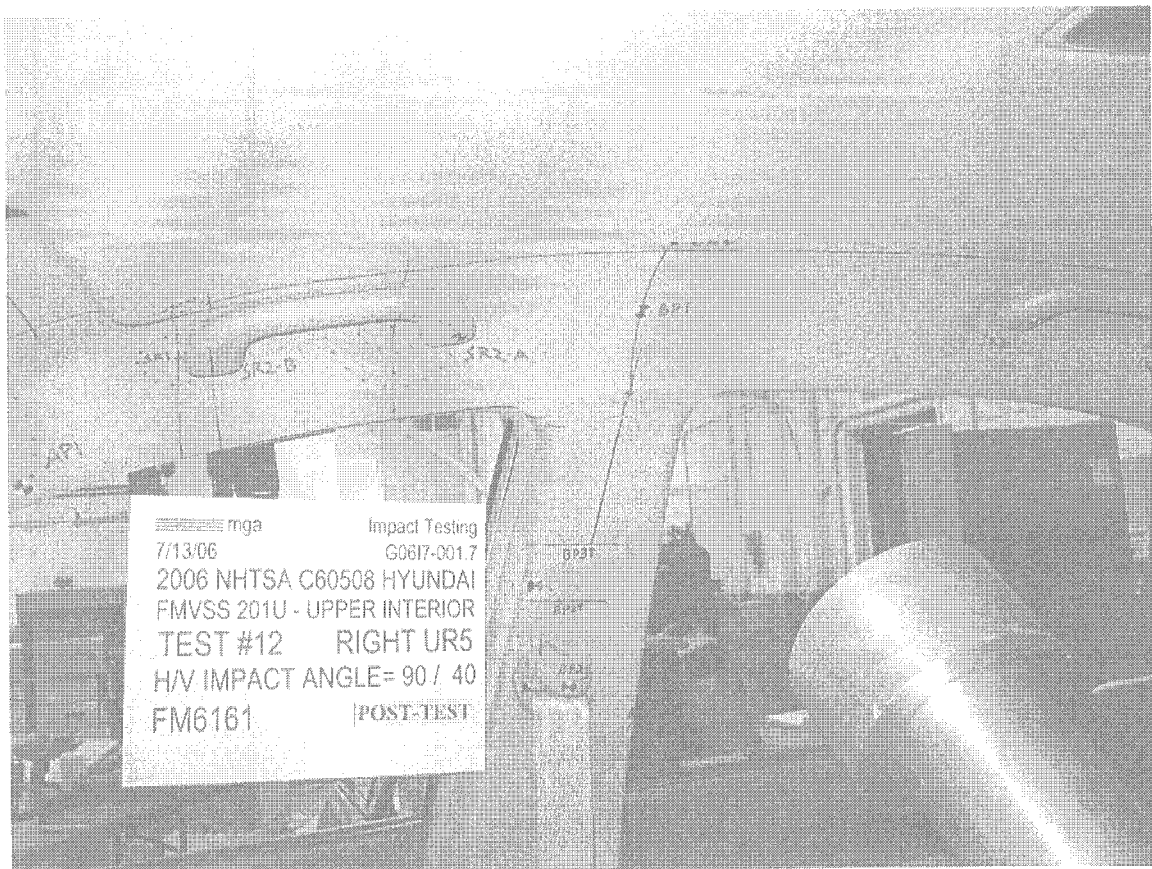
Vehicle Program : Hyundai
Test Date: 7/13/06

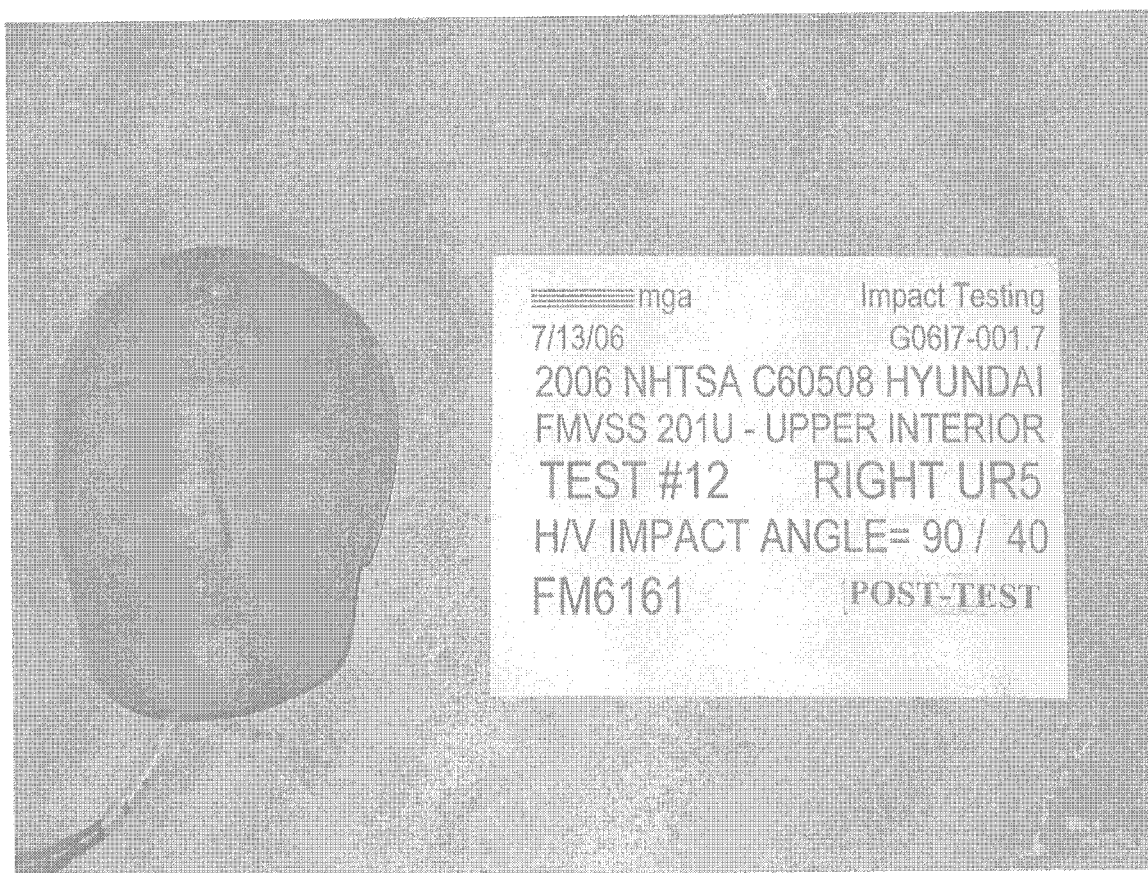
Model Year: 2006
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 158/-5

HIC(d) = 496, HIC = 437, Delta T = 8.5 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#12

Target (Vehicle Side): UR5Right

Temperature:22C

MGA Test Reference No.:FM6161

Humidity:44%

Approach Horizontal Angles:90°

Time of Test:5:00 PM

Approach Vertical Angles: 40°

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
896	967	7.1	24.2	45	10 Left

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35924	-91.4	1.54	1.54
Y	6	J35919	94.4	1.53	1.52
Z	7	J22664	94.3	1.46	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Headliner displacement.

Recorded By: Matt Kerr Approved By*: Heena Kalita Date: 7/13/06

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G0617-001.7

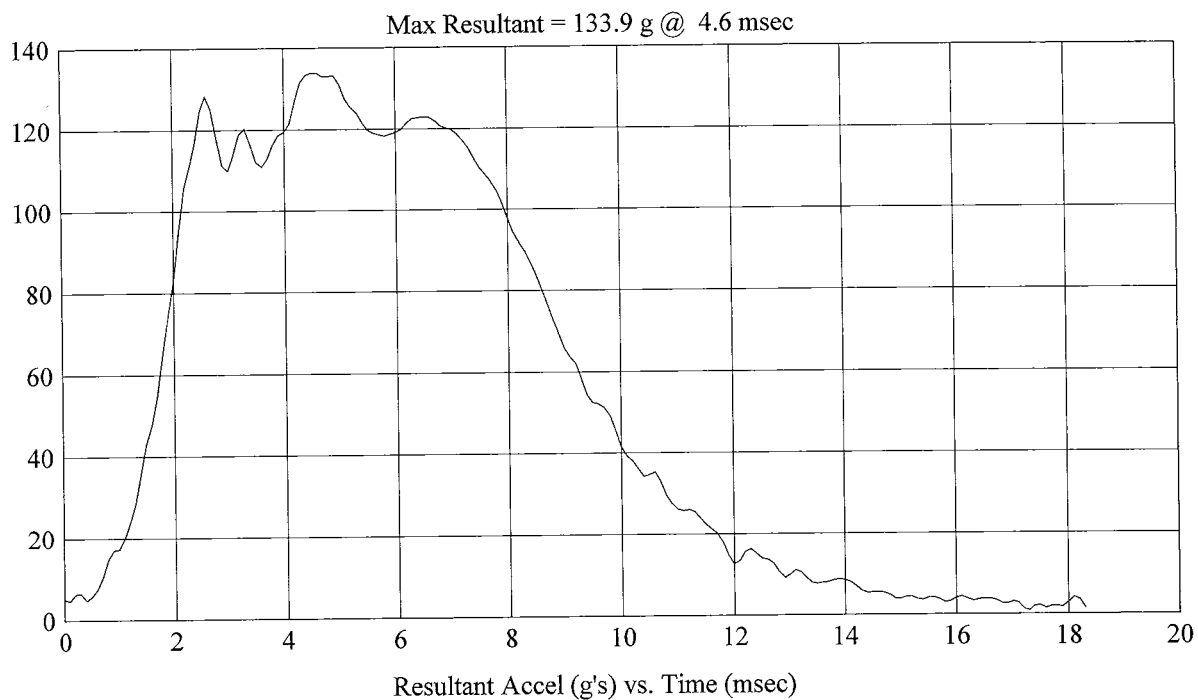
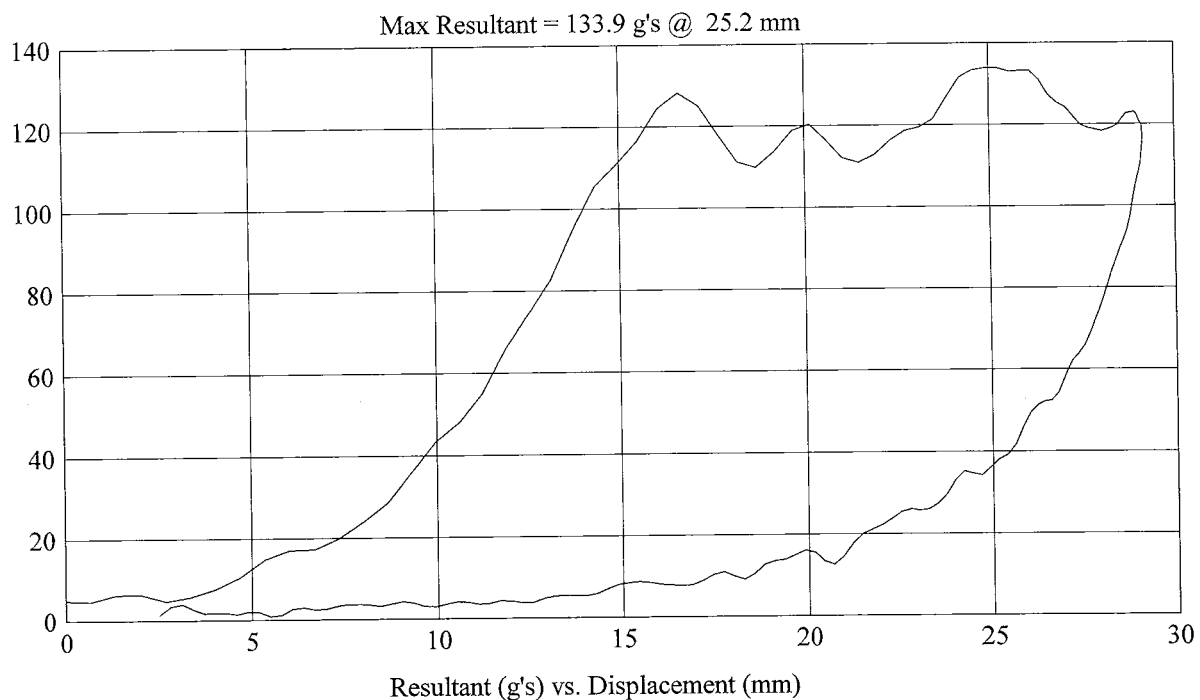
Customer: NHTSA
Test # 12
FM6161
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/ 40

HIC(d) = 896, HIC = 967, Delta T = 7.1 msec



FMH
G06I7-001.7

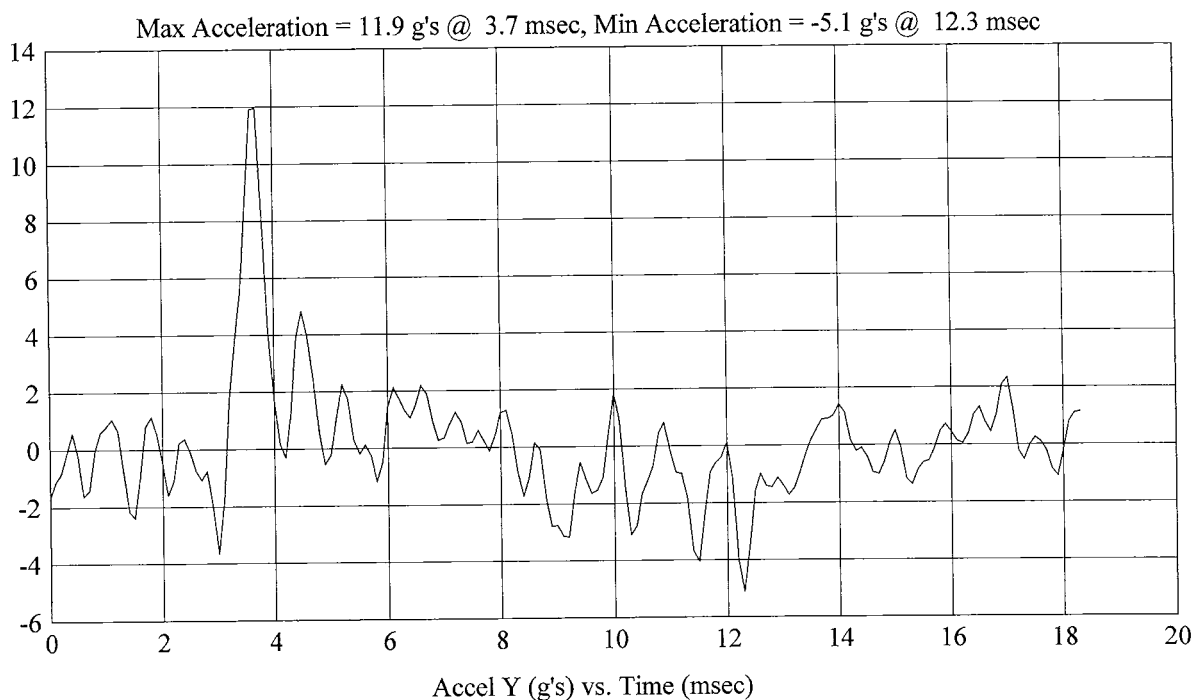
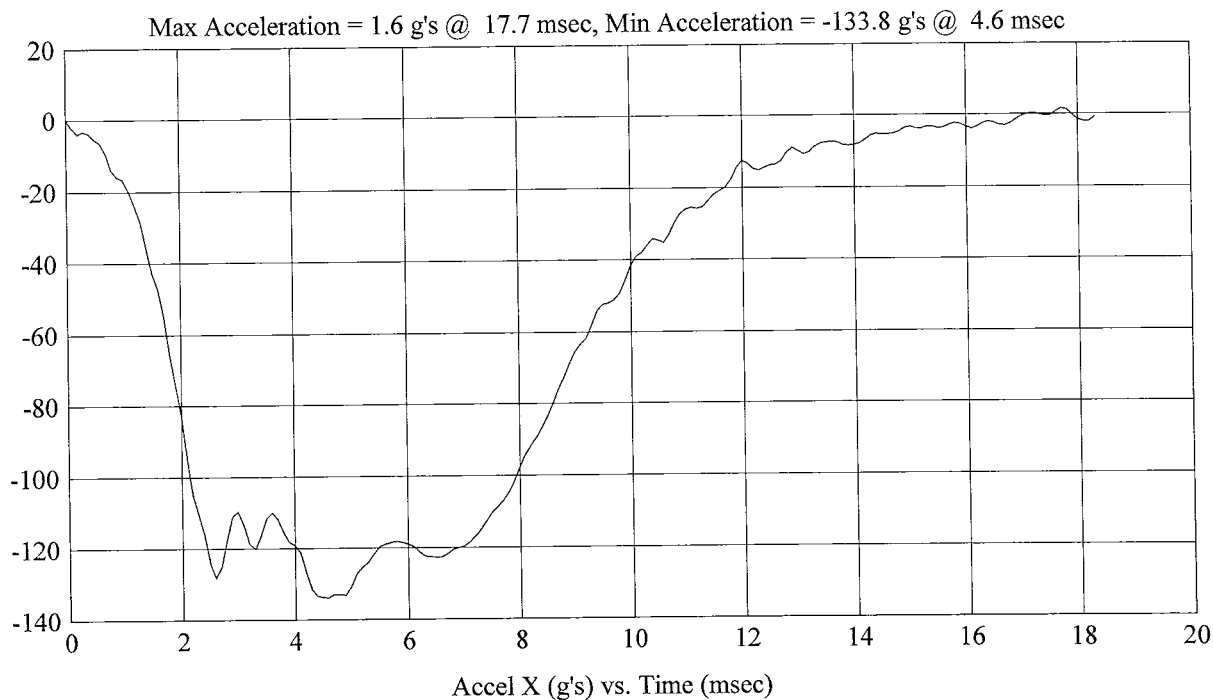
Customer: NHTSA
Test # 12
FM6161
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/ 40

HIC(d) = 896, HIC = 967, Delta T = 7.1 msec



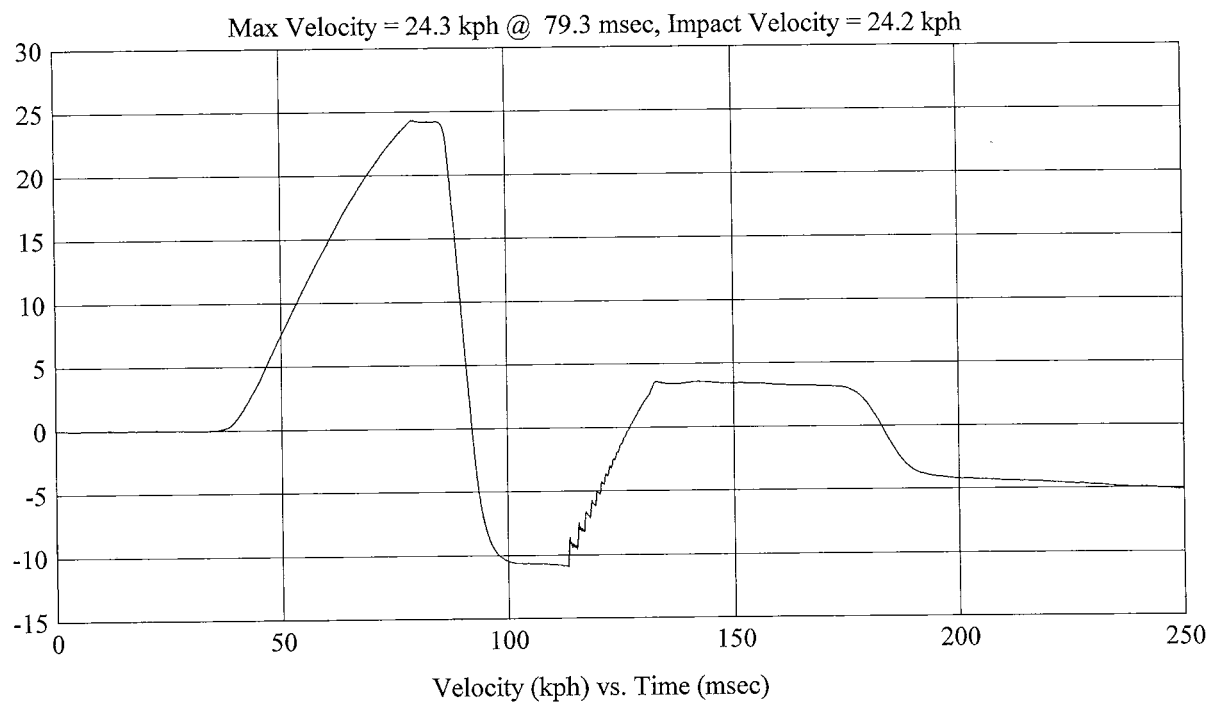
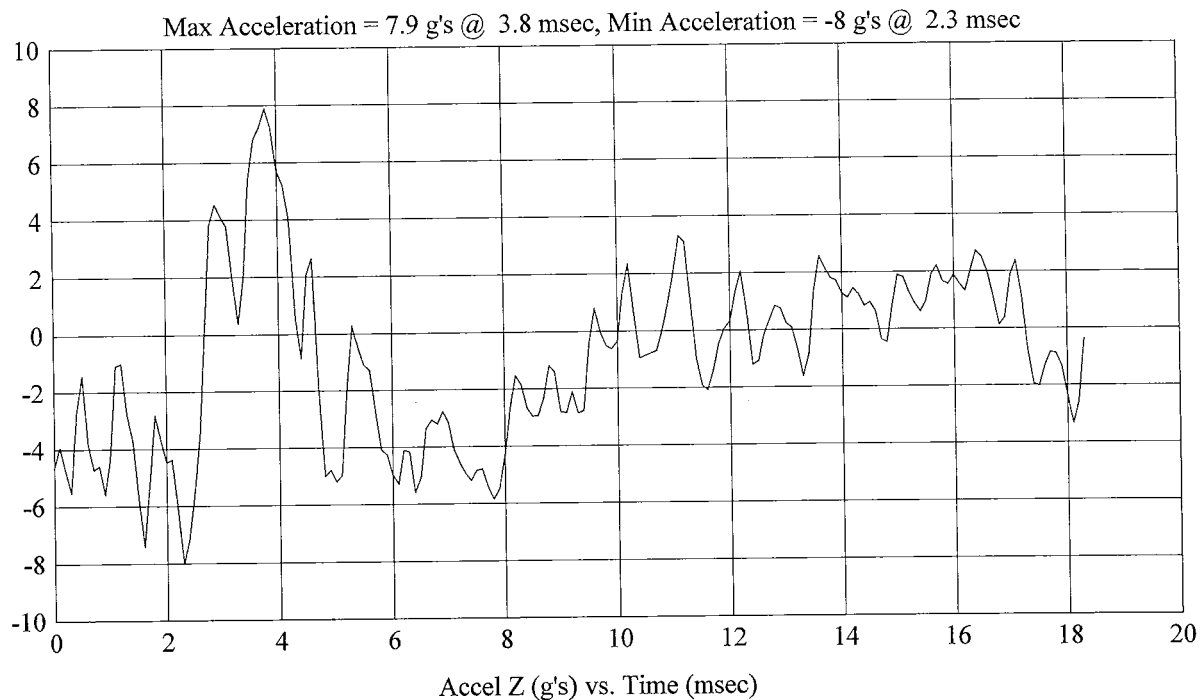
FMH
G06I7-001.7

Customer: NHTSA
Test # 12
FM6161
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/ 40

HIC(d) = 896, HIC = 967, Delta T = 7.1 msec



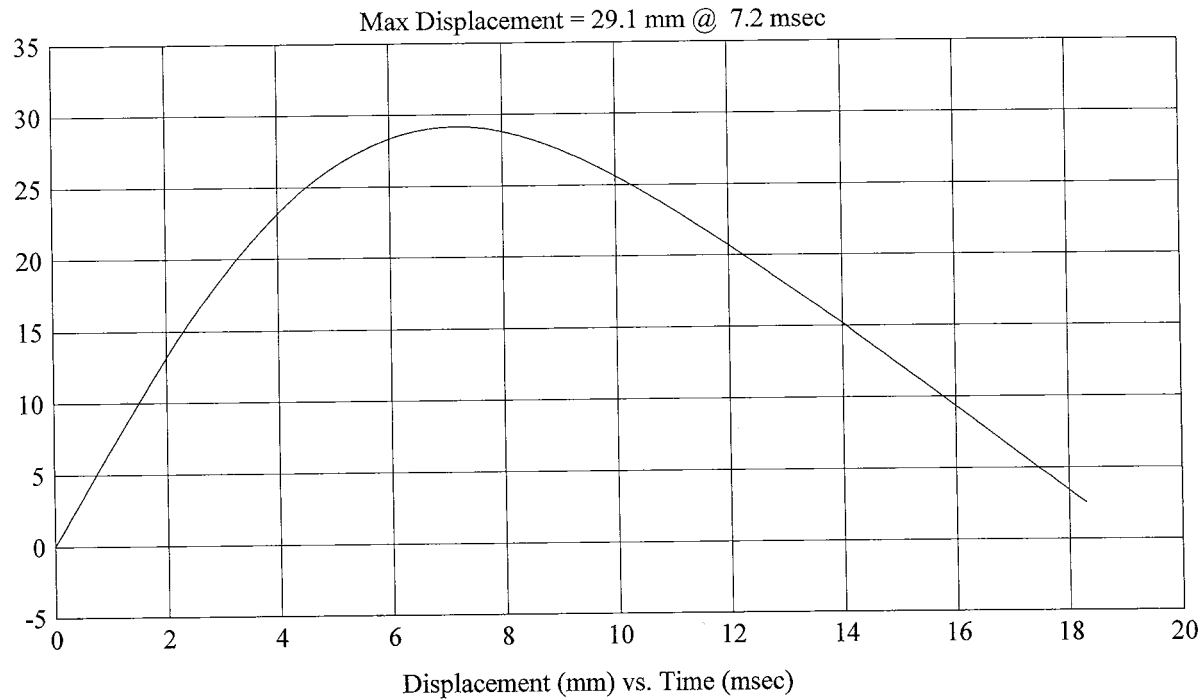
FMH
G06I7-001.7

Customer: NHTSA
Test # 12
FM6161
Additional Desc: N/A

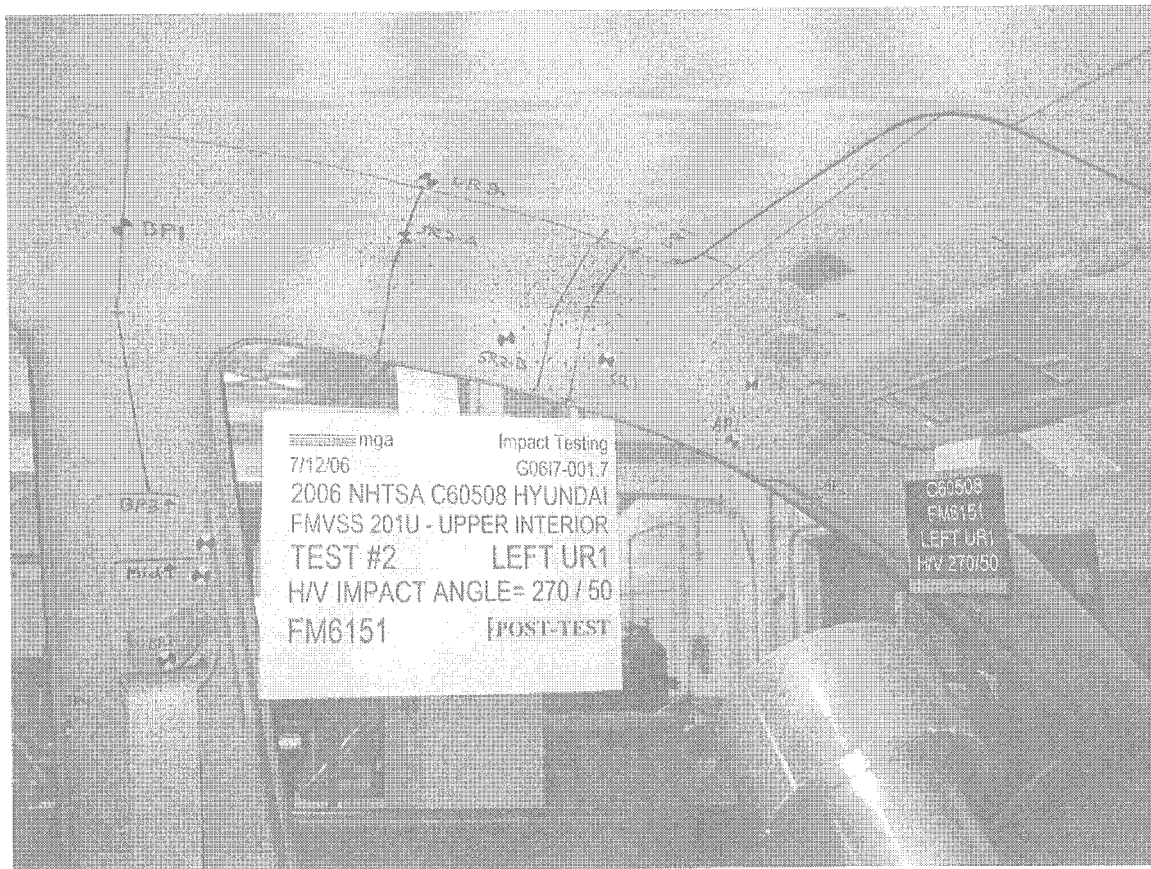
Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR5
Vehicle Side: Right
Horz/Vert Angle: 90/ 40

HIC(d) = 896, HIC = 967, Delta T = 7.1 msec









mga Impact Testing
7/12/06 G0617-001.7
2006 NHTSA C60508 HYUNDAI
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
FM6151 POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#2

Target (Vehicle Side): UR1Left

Temperature:23C

MGA Test Reference No.:FM6151

Humidity:54%

Approach Horizontal Angles:270°

Time of Test:11:45 AM

Approach Vertical Angles:50°

FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
775	806	6.1	25.1	27	3 Right

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108.8	1.55	1.55
Y	6	J36193	102.7	1.53	1.53
Z	7	J36353	97.2	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

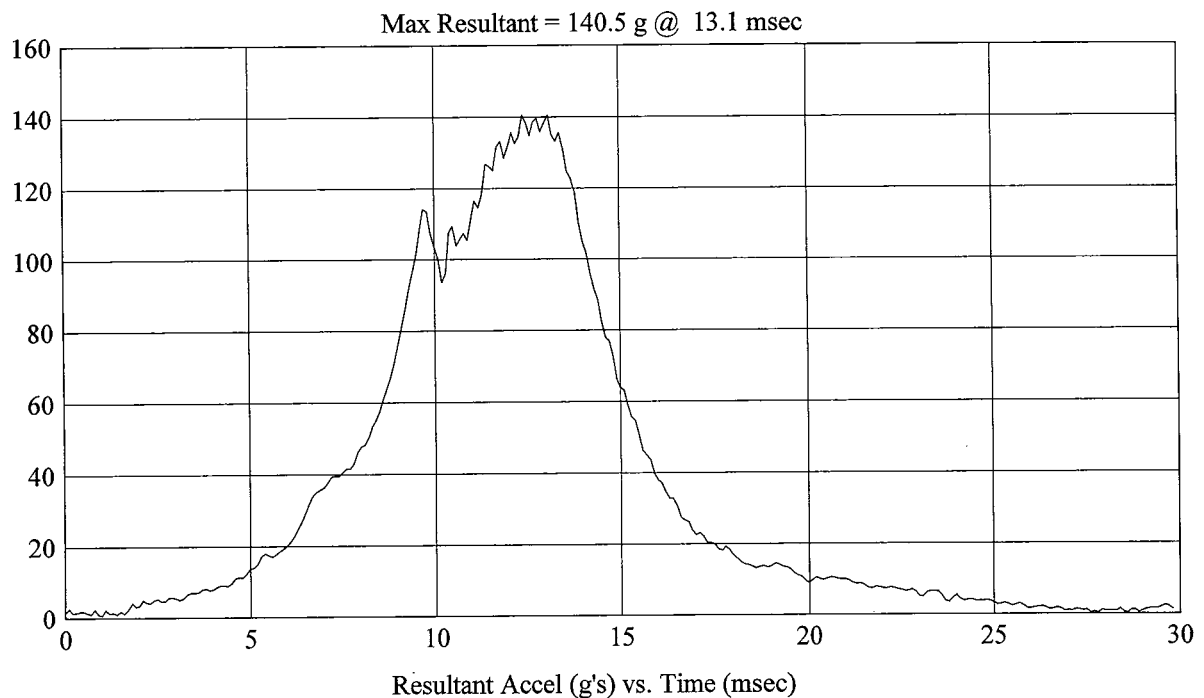
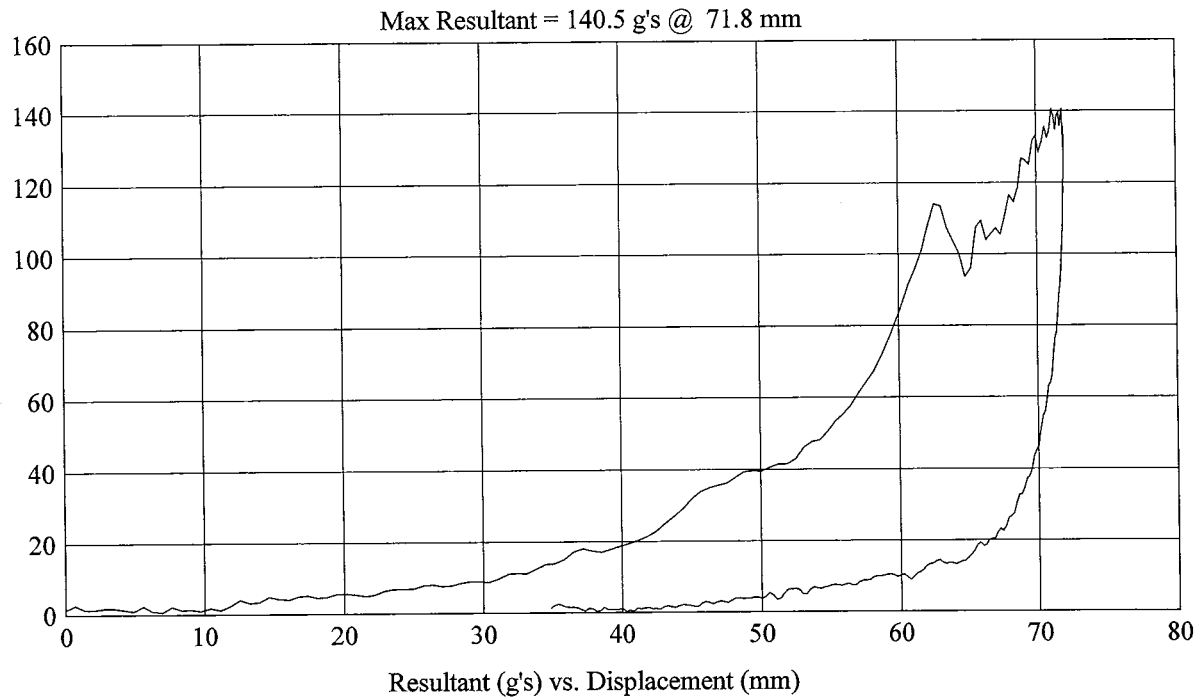
FMH
G06I7-001.7

Customer: NHTSA
Test # 2
FM6151
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: UR1
Vehicle Side: Left
Horz/Vert Angle: 270/50

HIC(d) = 775, HIC = 806, Delta T = 6.1 msec



FMH
G06I7-001.7

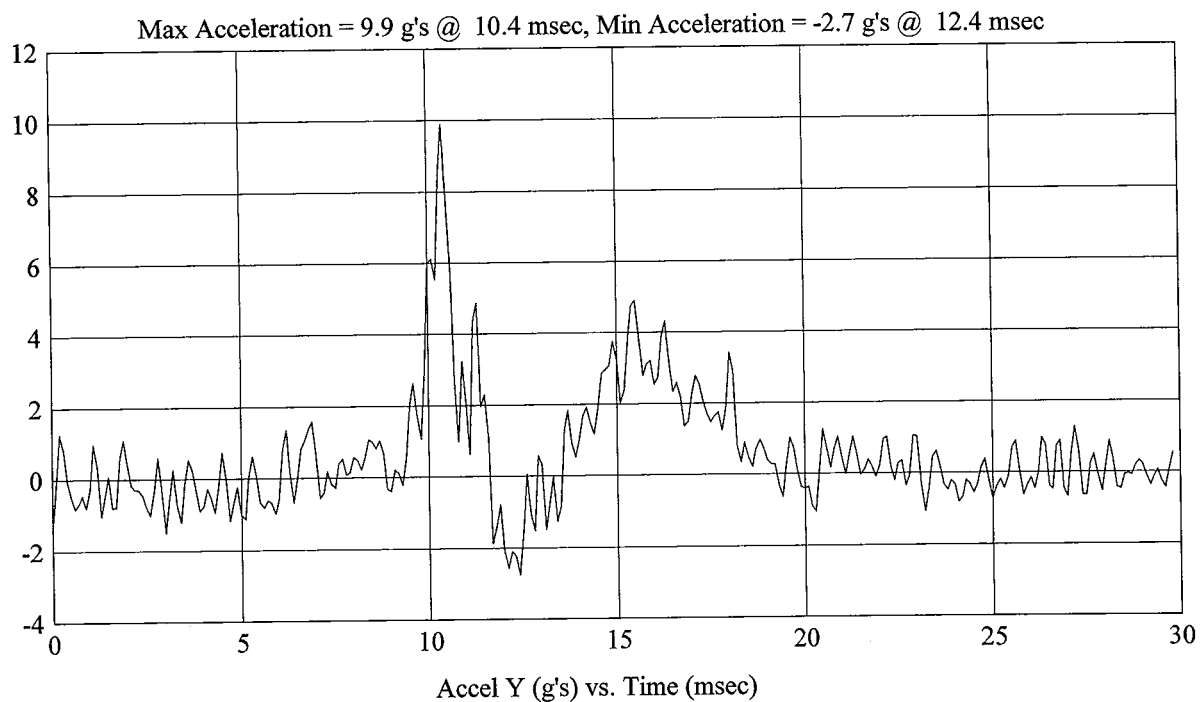
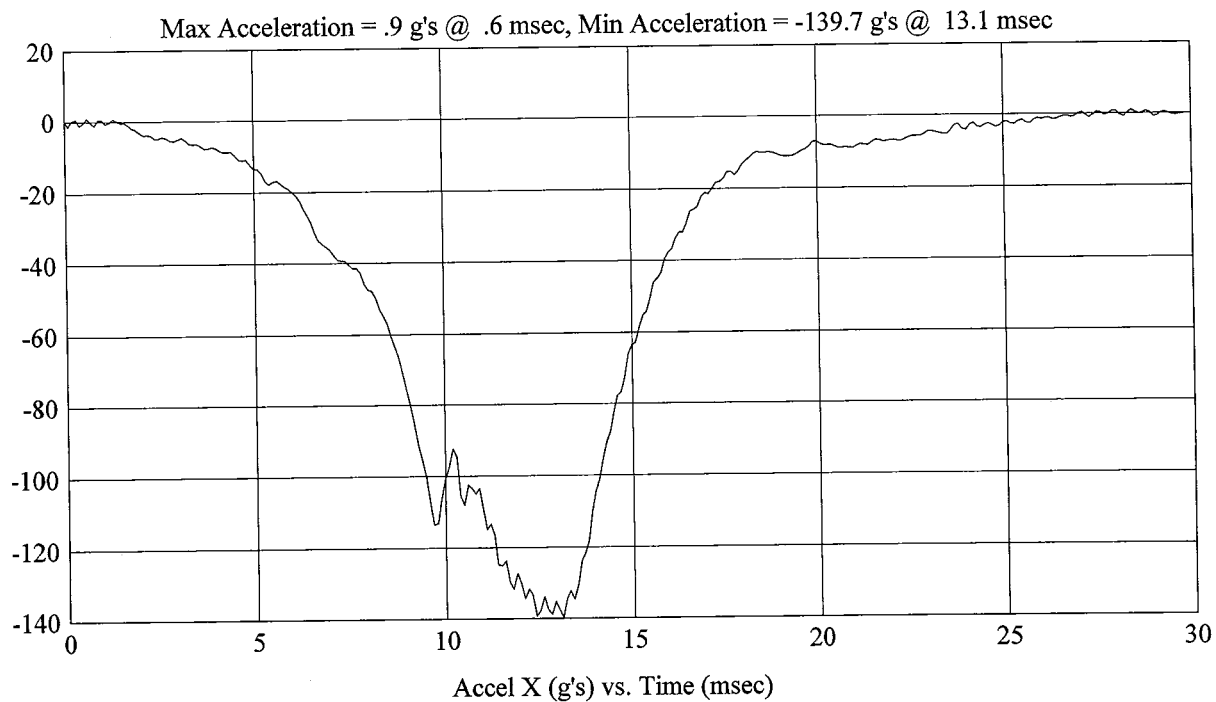
Customer: NHTSA
Test # 2
FM6151
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: UR1
Vehicle Side: Left
Horz/Vert Angle: 270/50

HIC(d) = 775, HIC = 806, Delta T = 6.1 msec



FMH
G06I7-001.7

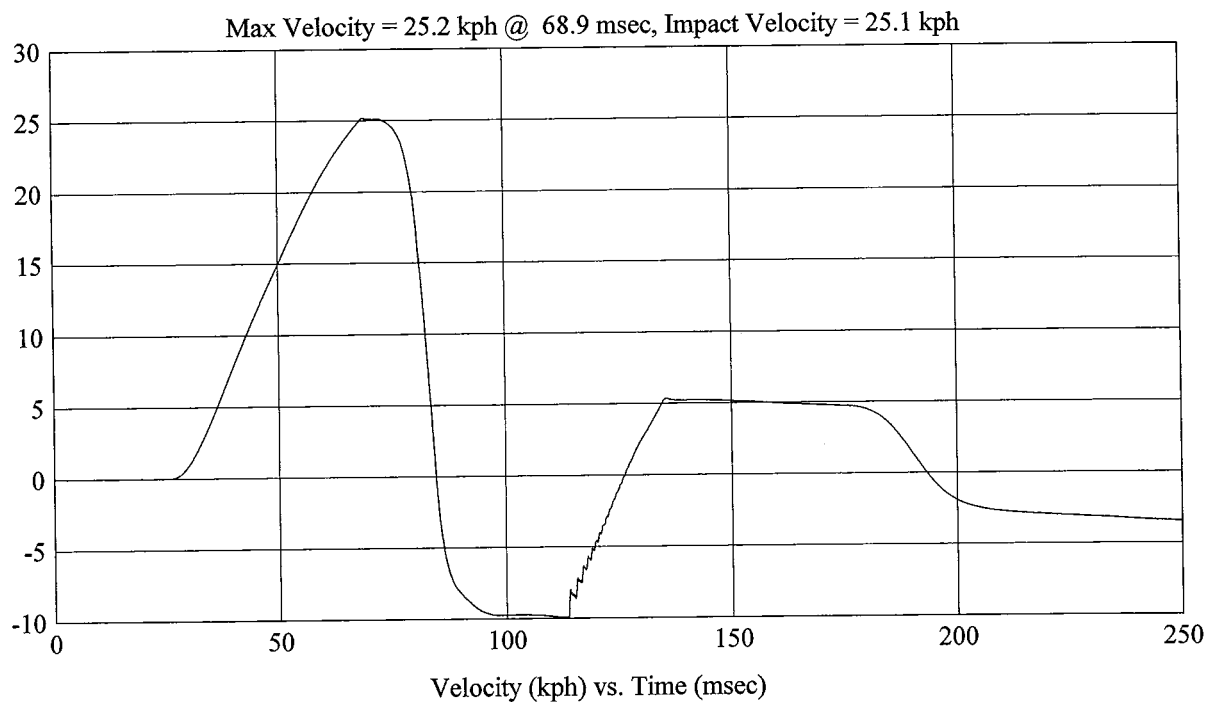
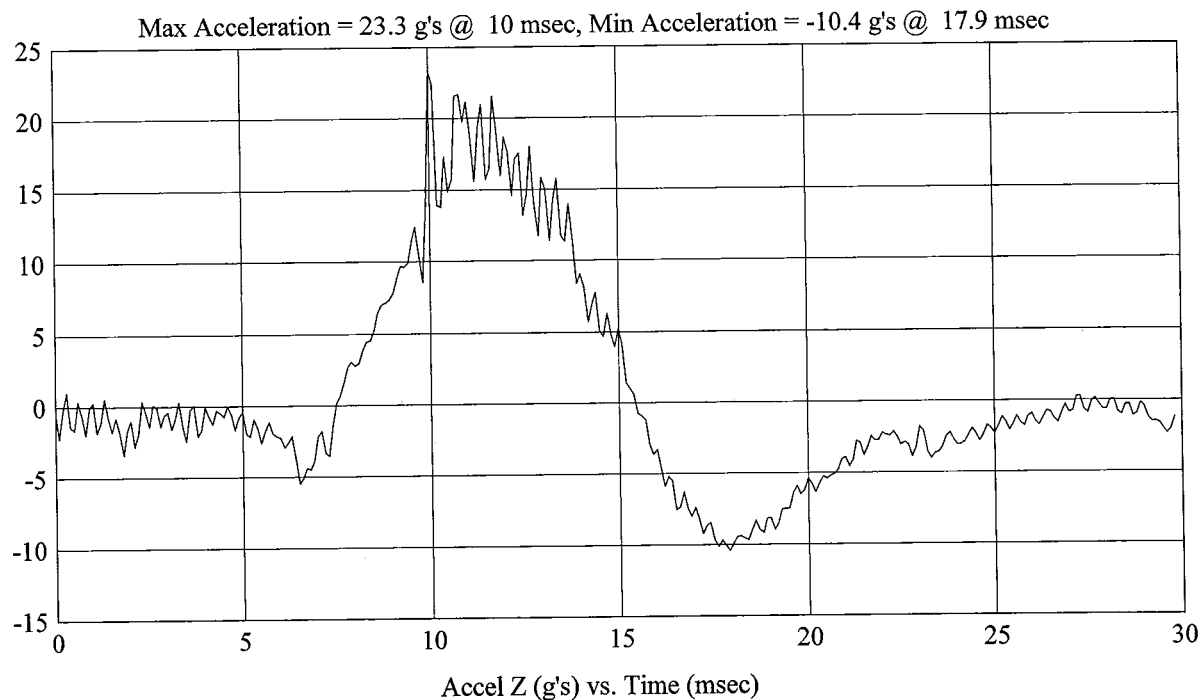
Customer: NHTSA
Test # 2
FM6151
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: UR1
Vehicle Side: Left
Horz/Vert Angle: 270/50

HIC(d) = 775, HIC = 806, Delta T = 6.1 msec



FMH
G06I7-001.7

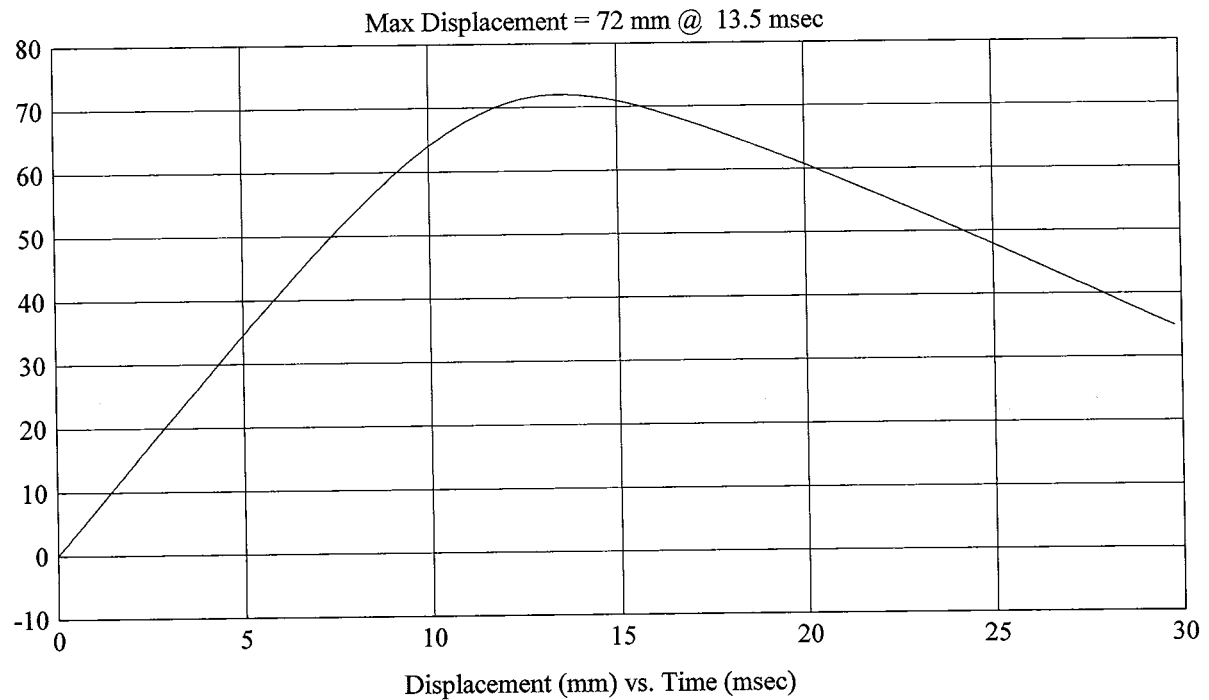
Customer: NHTSA
Test # 2
FM6151
Additional Desc: N/A

Vehicle Program : Hyundai

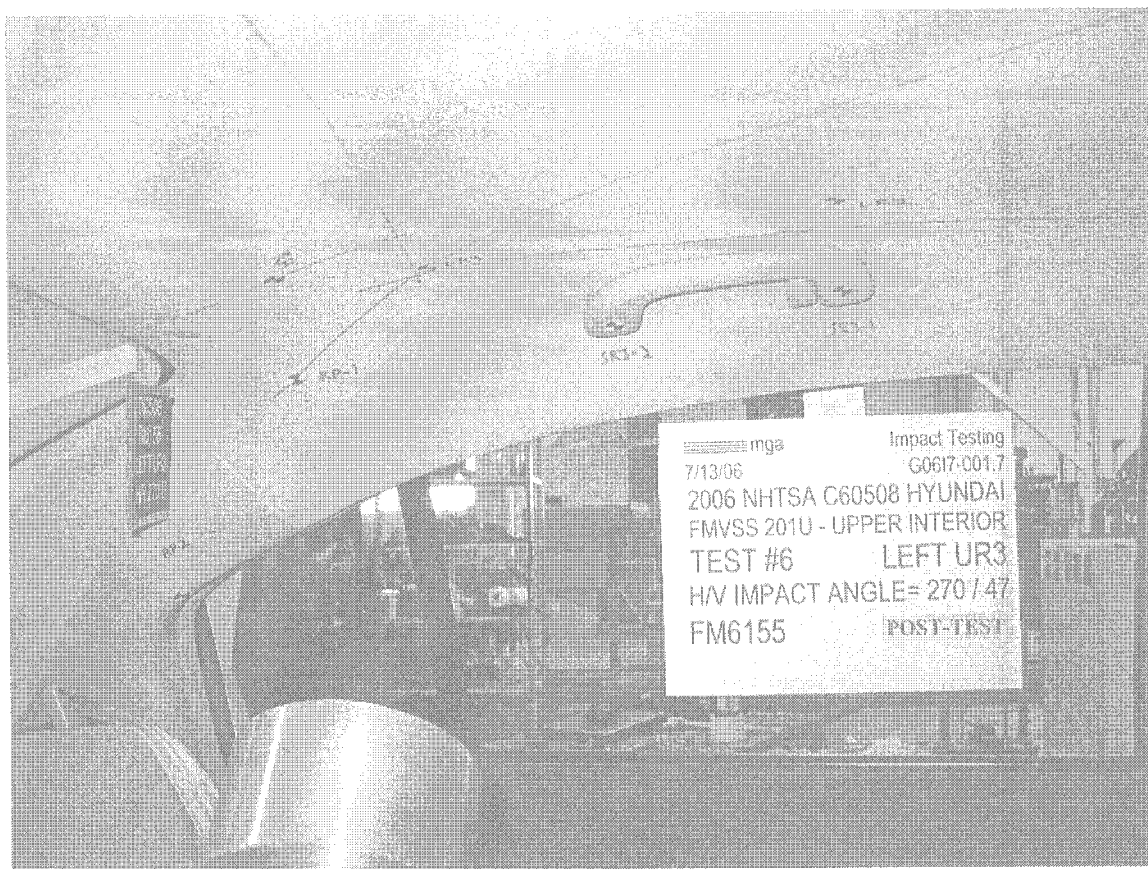
Test Date: 7/12/06

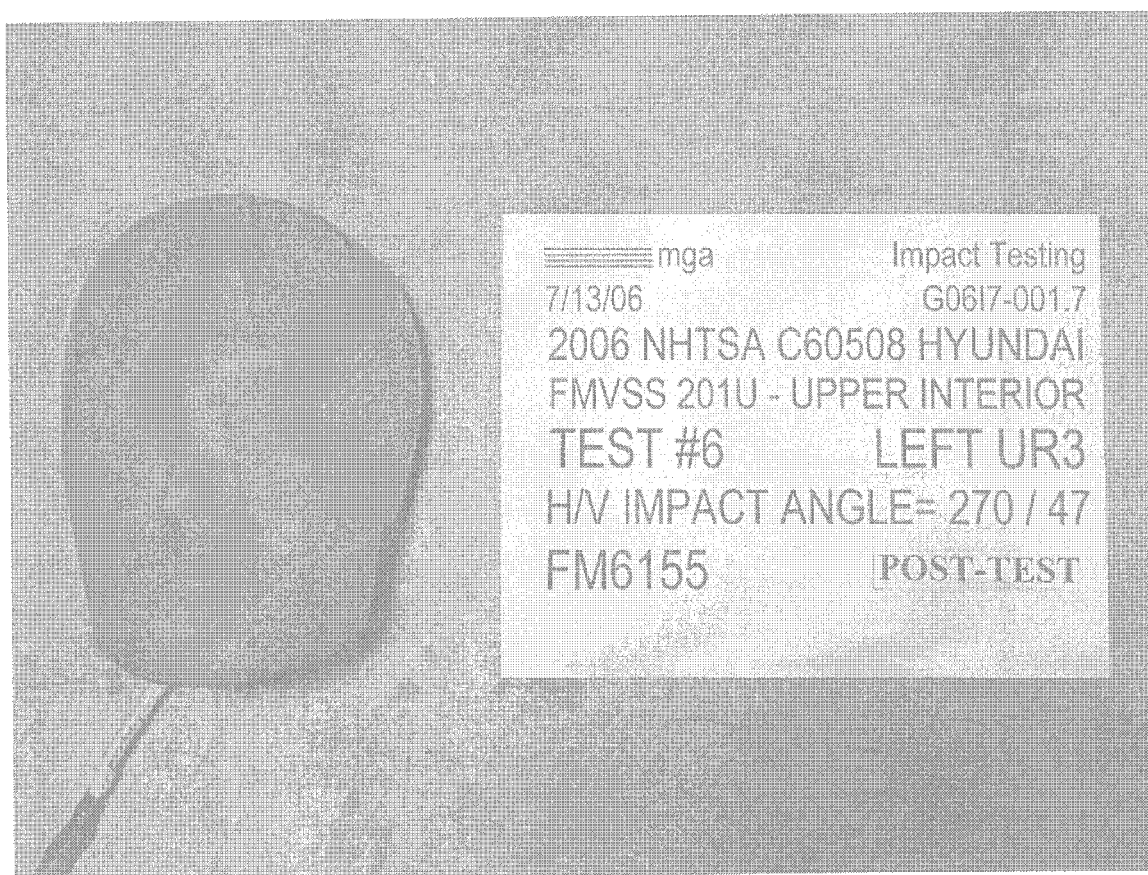
Model Year: 2006
Target: UR1
Vehicle Side: Left
Horz/Vert Angle: 270/50

HIC(d) = 775, HIC = 806, Delta T = 6.1 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#6

Target (Vehicle Side): UR3Left

Temperature:22C

MGA Test Reference No.:FM6155

Humidity:43%

Approach Horizontal Angles:270°

Time of Test:9:30 AM

Approach Vertical Angles:47°

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
718	731	8.4	24.0	25	9 Left

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35924	-91.4	1.54	1.55
Y	6	J35919	94.4	1.53	1.53
Z	7	J22664	94.3	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By: Matt Kerr Approved By*: Heena A. Kalita Date: 7/13/06
 *Only necessary for NHTSA (Government) Compliance testing.

FMH
G06I7-001.7

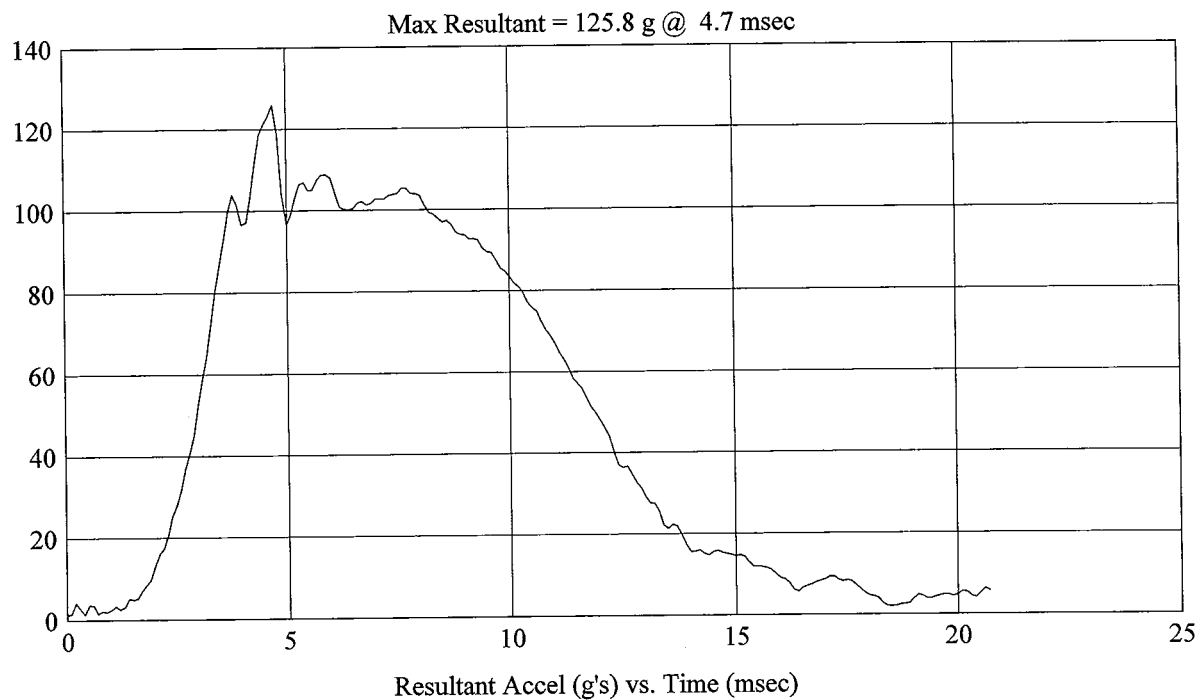
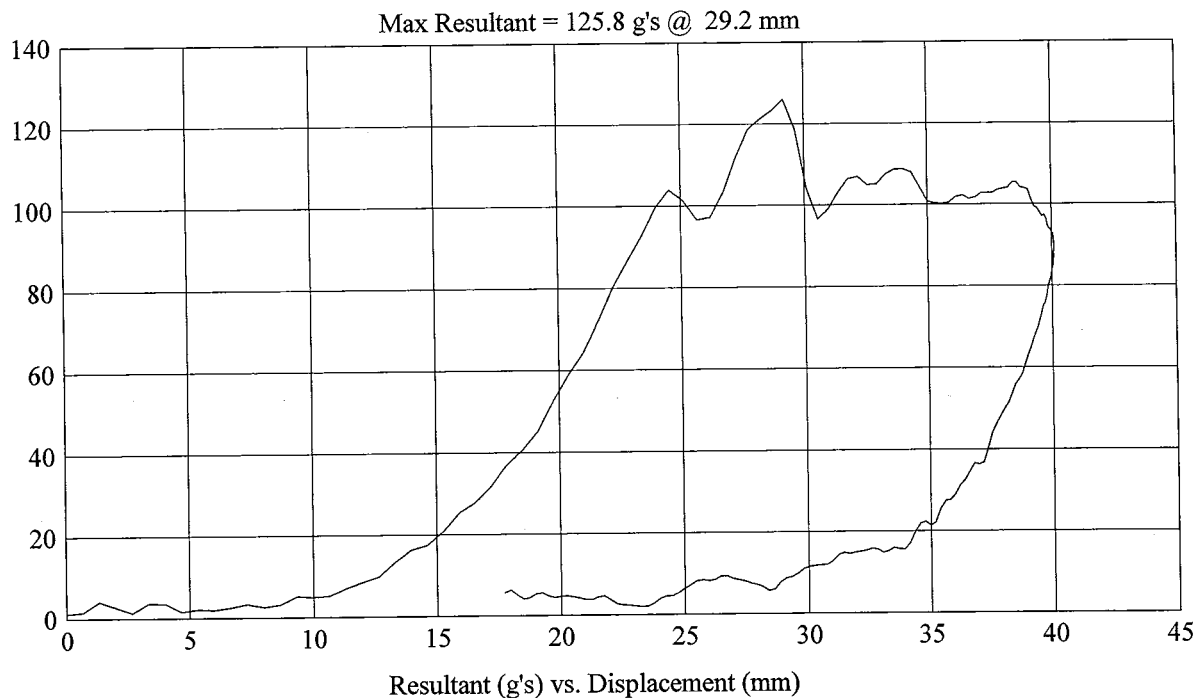
Customer: NHTSA
Test # 6
FM6155
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: UR3
Vehicle Side: Left
Horz/Vert Angle: 270/47

HIC(d) = 718, HIC = 731, Delta T = 8.4 msec



FMH
G06I7-001.7

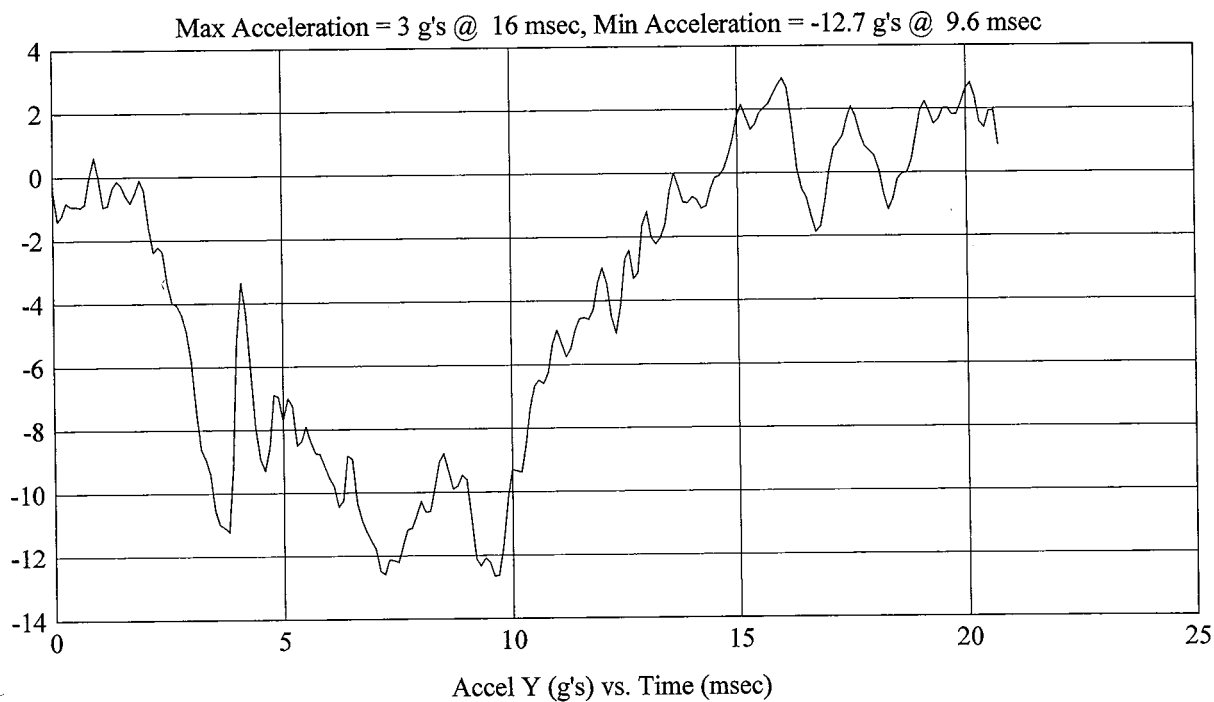
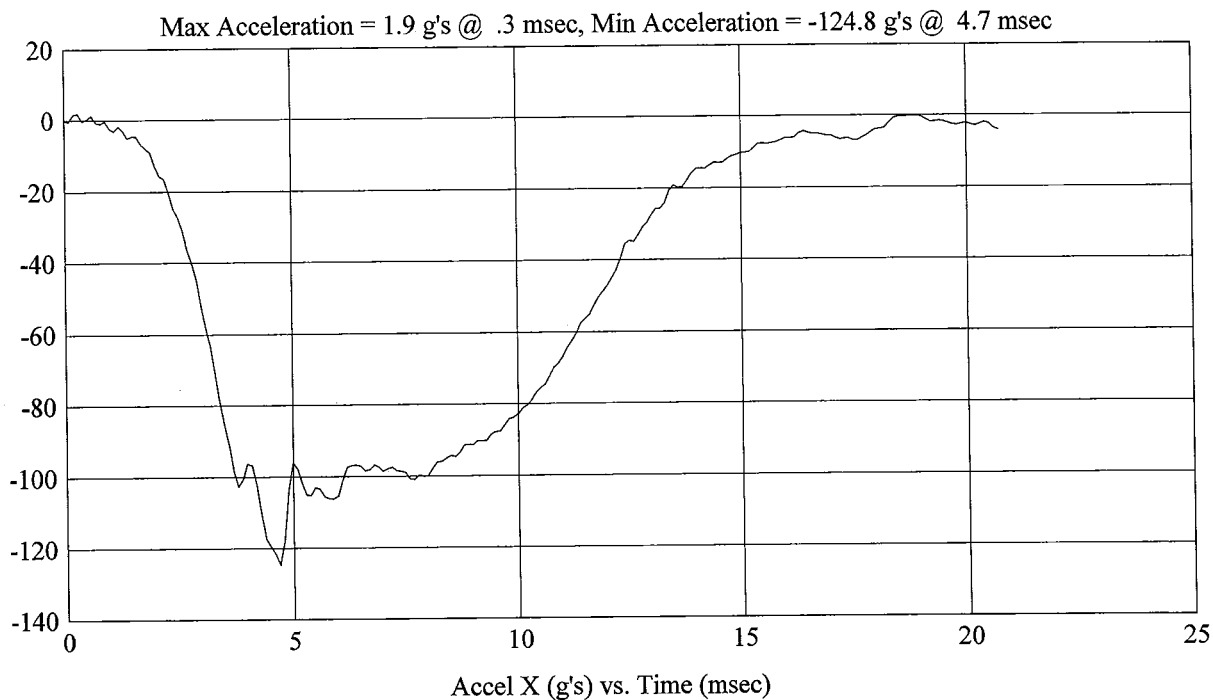
Customer: NHTSA
Test # 6
FM6155
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

Model Year: 2006
Target: UR3
Vehicle Side: Left
Horz/Vert Angle: 270/47

HIC(d) = 718, HIC = 731, Delta T = 8.4 msec



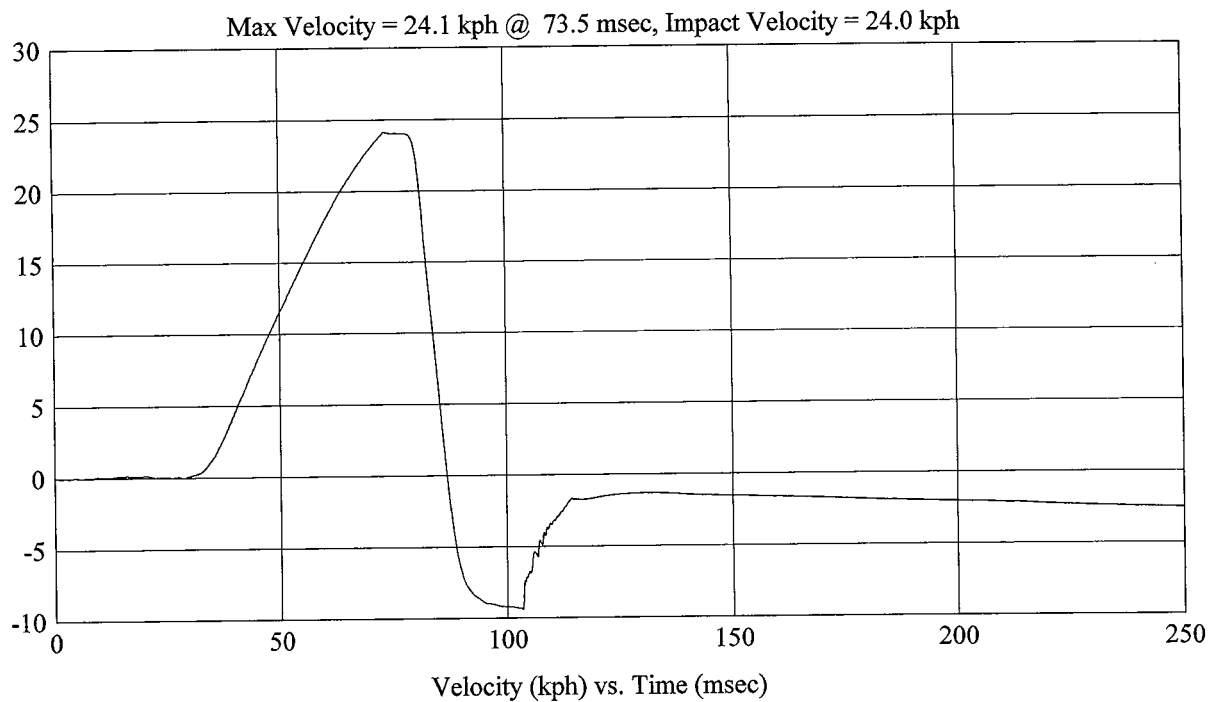
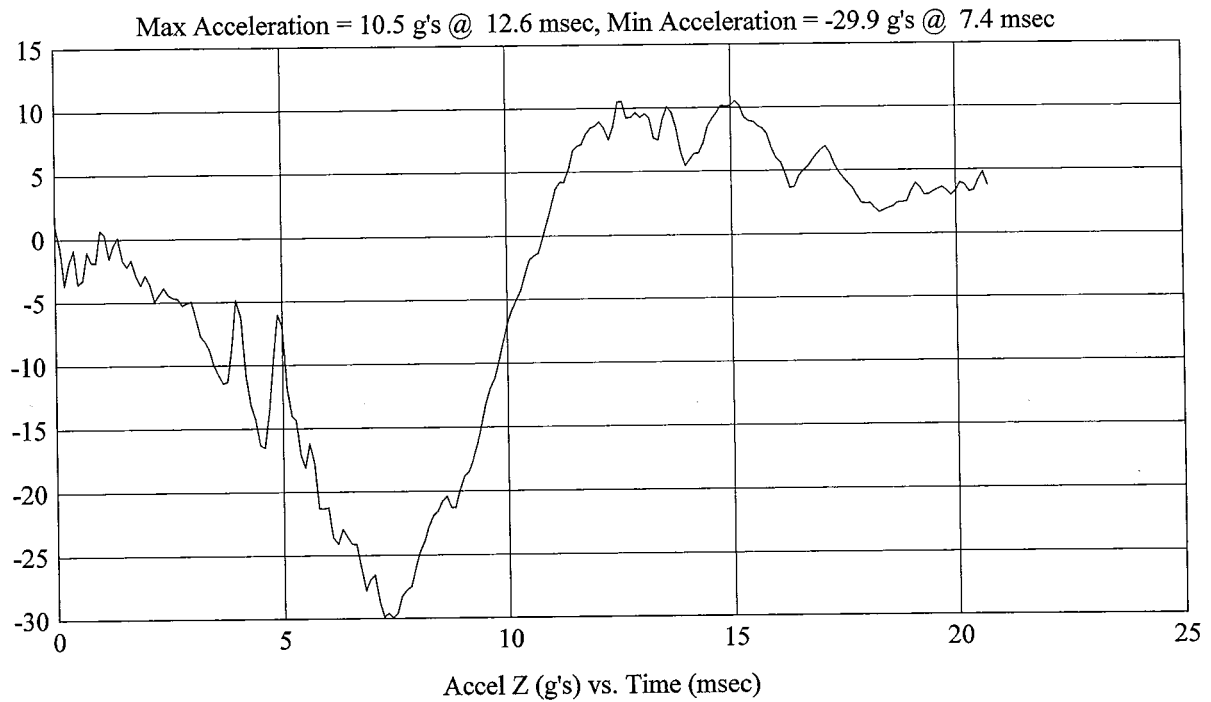
FMH
G06I7-001.7

Customer: NHTSA
Test # 6
FM6155
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR3
Vehicle Side: Left
Horz/Vert Angle: 270/47

HIC(d) = 718, HIC = 731, Delta T = 8.4 msec



FMH
G06I7-001.7

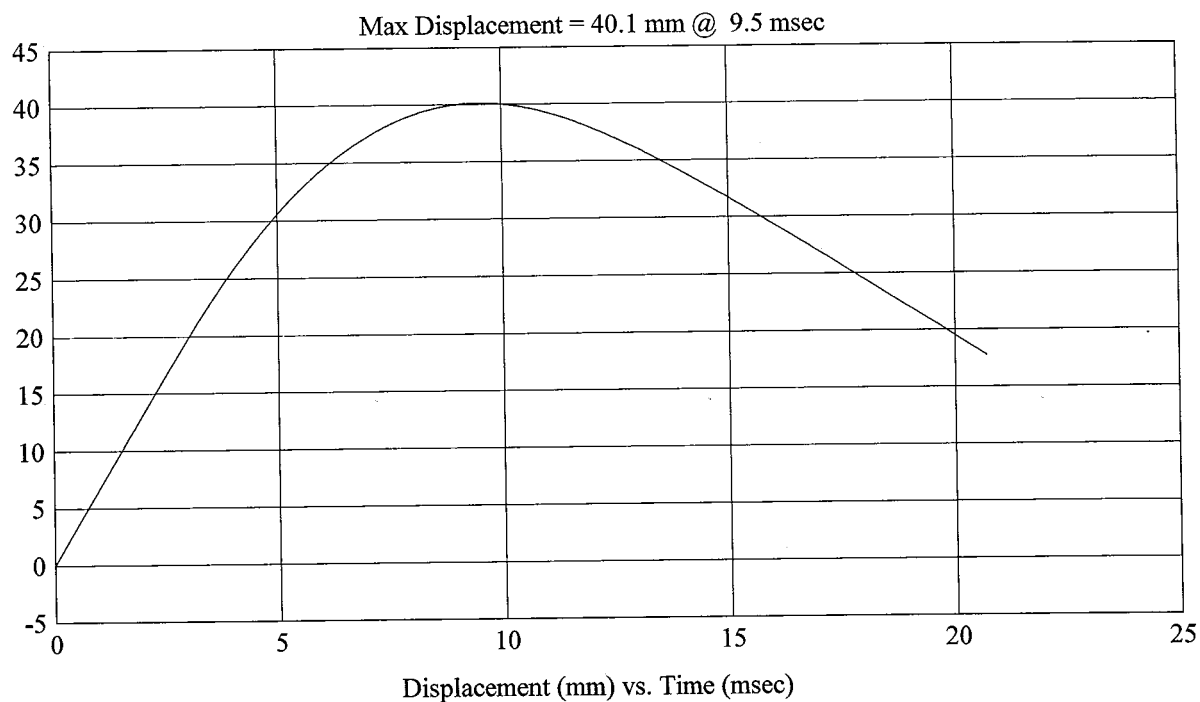
Customer: NHTSA
Test # 6
FM6155
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/13/06

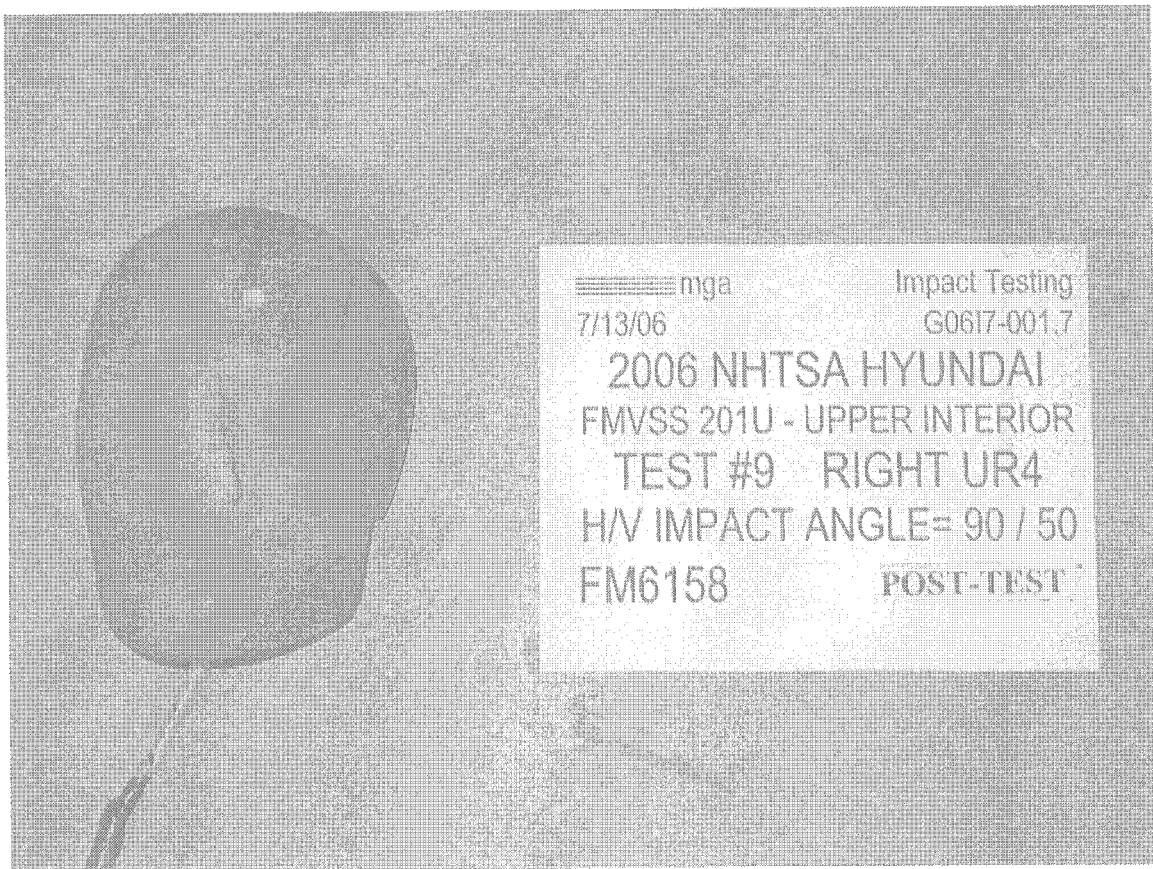
Model Year: 2006
Target: UR3
Vehicle Side: Left
Horz/Vert Angle: 270/47

HIC(d) = 718, HIC = 731, Delta T = 8.4 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7 VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#9

Target (Vehicle Side): UR4Right

Temperature:22C

MGA Test Reference No.:FM6158

Humidity:45%

Approach Horizontal Angles:90°

Time of Test:2:00 PM

Approach Vertical Angles:50°

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
641	629	10.3	24.8	15	22 Left

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35924	-91.4	1.54	1.55
Y	6	J35919	94.4	1.53	1.53
Z	7	J22664	94.3	1.45	1.46

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Headliner displacement.

Recorded By: Matt Kerr Approved By*: Deena A. Kalish Date: 7/13/06

*Only necessary for NHTSA (Government) Compliance testing.

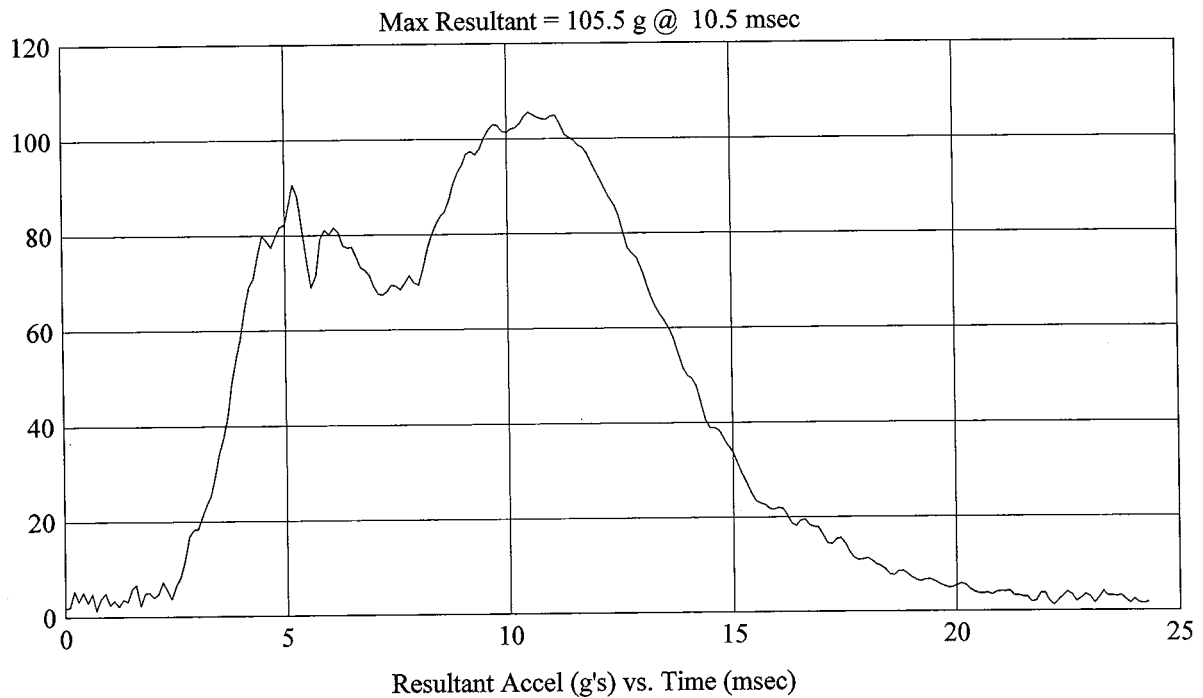
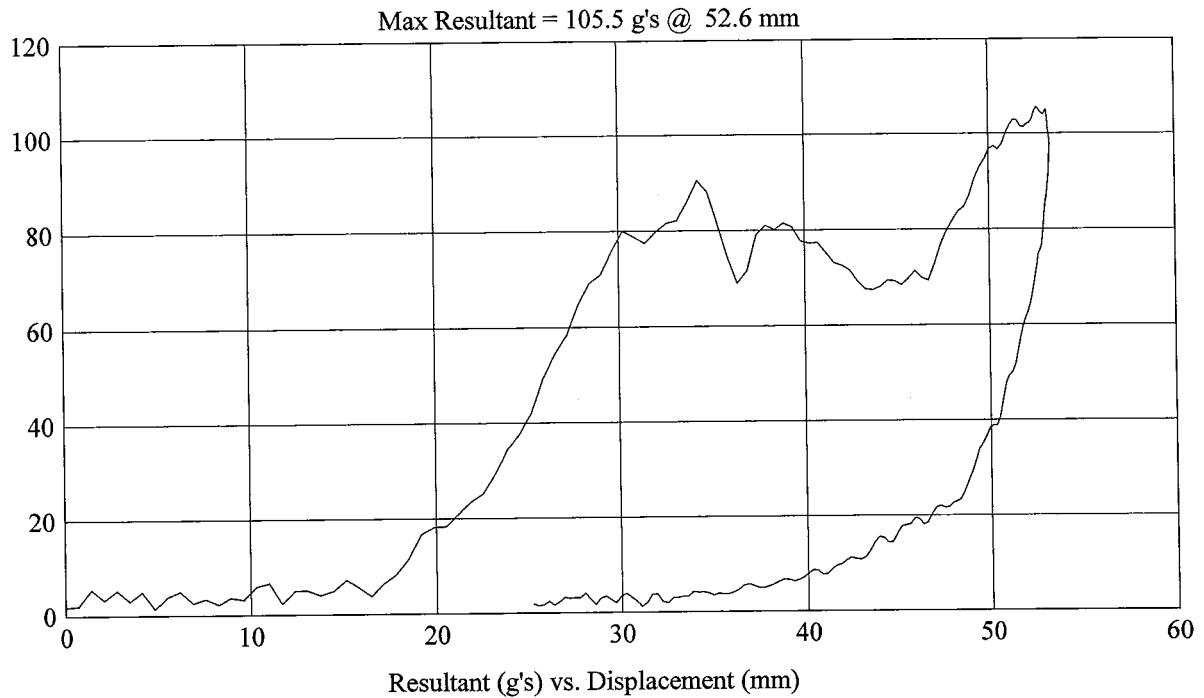
FMH
G06I7-001.7

Customer: NHTSA
Test # 9
FM6158
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR4
Vehicle Side: Right
Horz/Vert Angle: 90/50

HIC(d) = 641, HIC = 629, Delta T = 10.3 msec



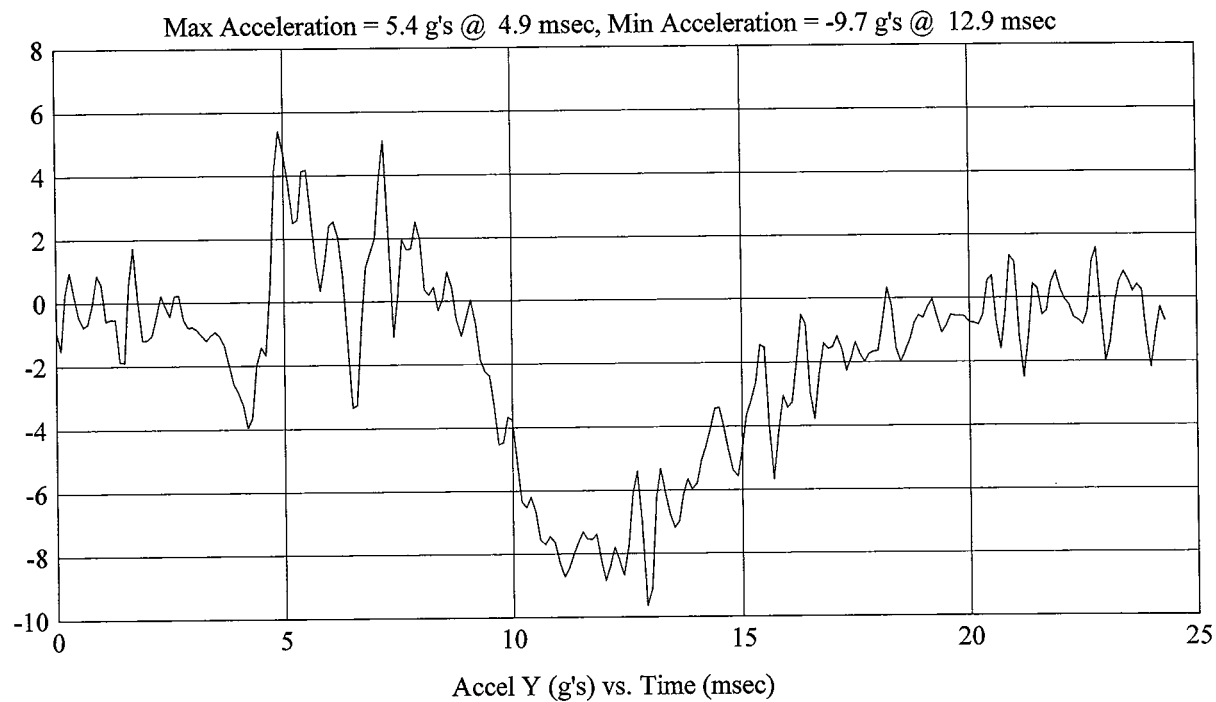
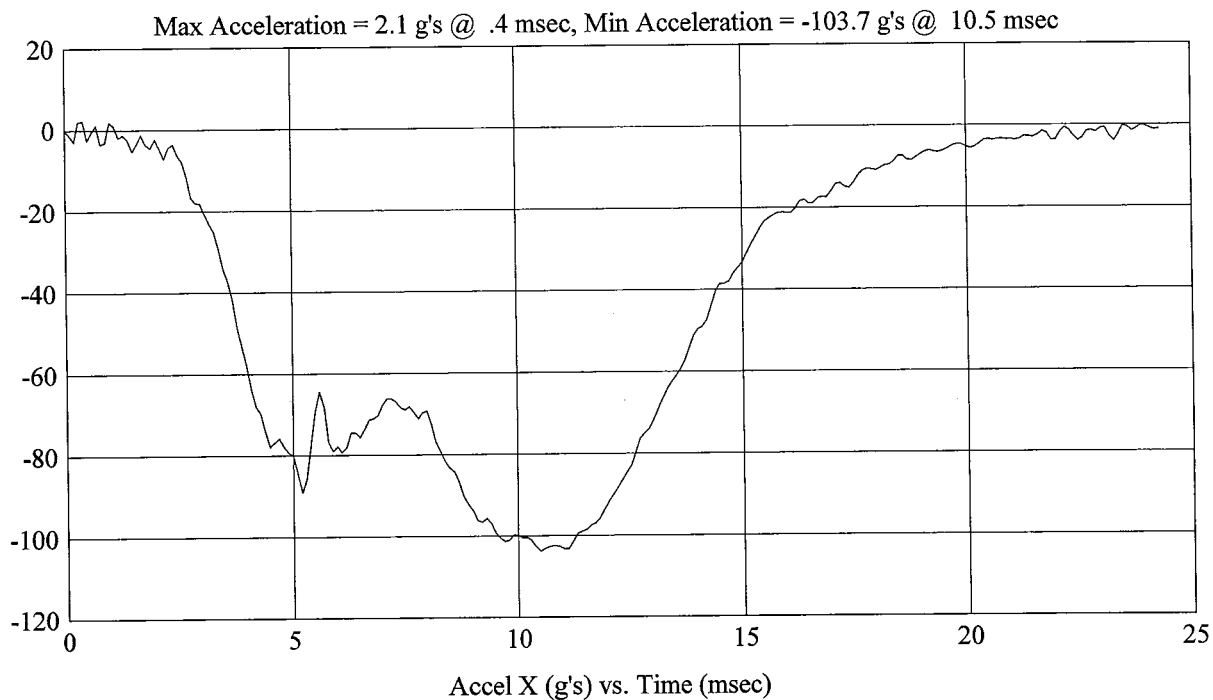
FMH
G06I7-001.7

Customer: NHTSA
Test # 9
FM6158
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR4
Vehicle Side: Right
Horz/Vert Angle: 90/50

HIC(d) = 641, HIC = 629, Delta T = 10.3 msec



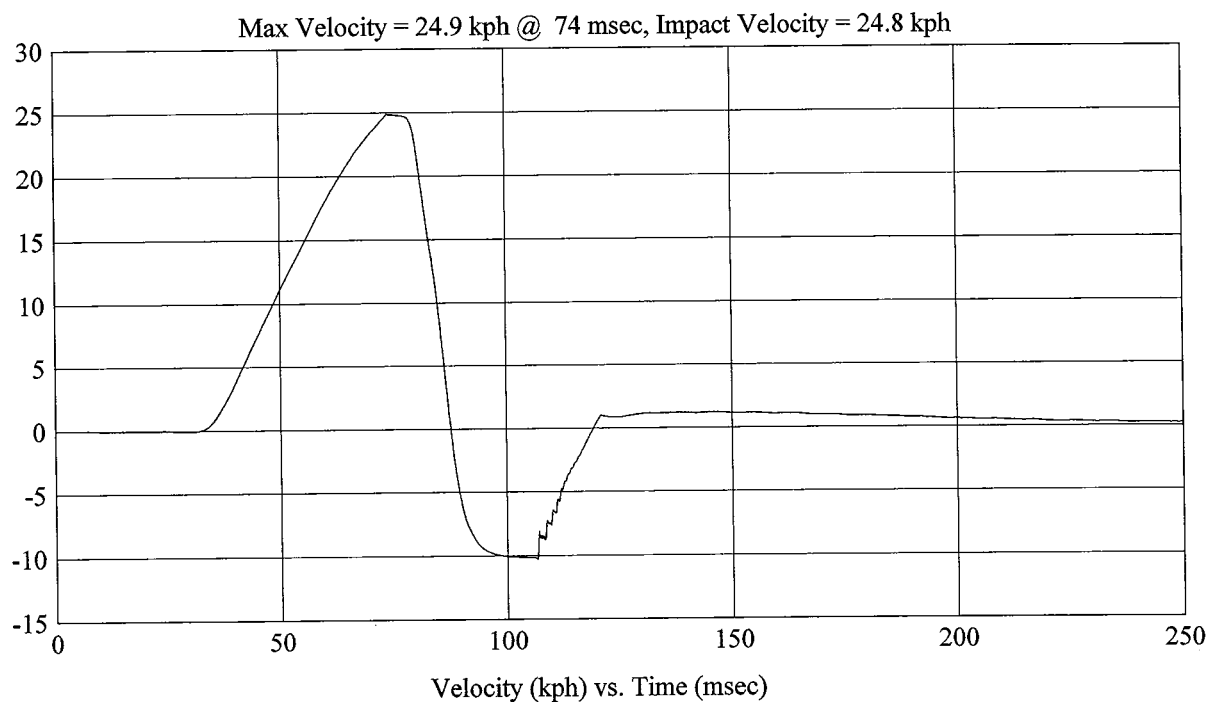
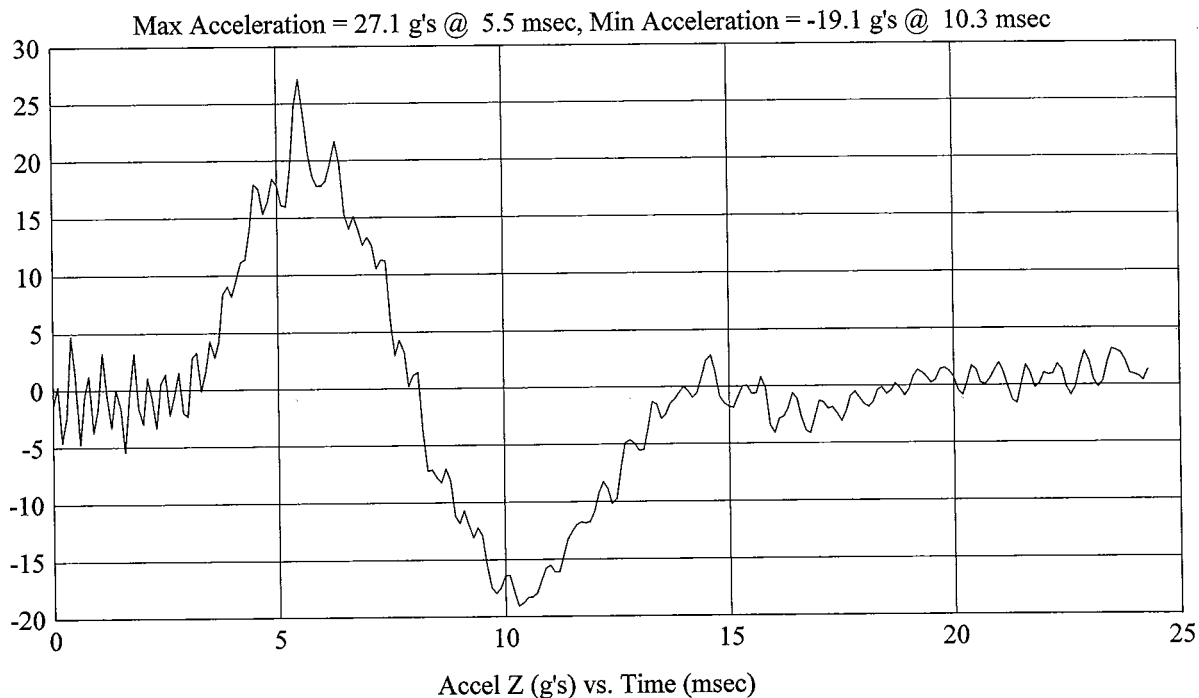
FMH
G06I7-001.7

Customer: NHTSA
Test # 9
FM6158
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR4
Vehicle Side: Right
Horz/Vert Angle: 90/50

HIC(d) = 641, HIC = 629, Delta T = 10.3 msec



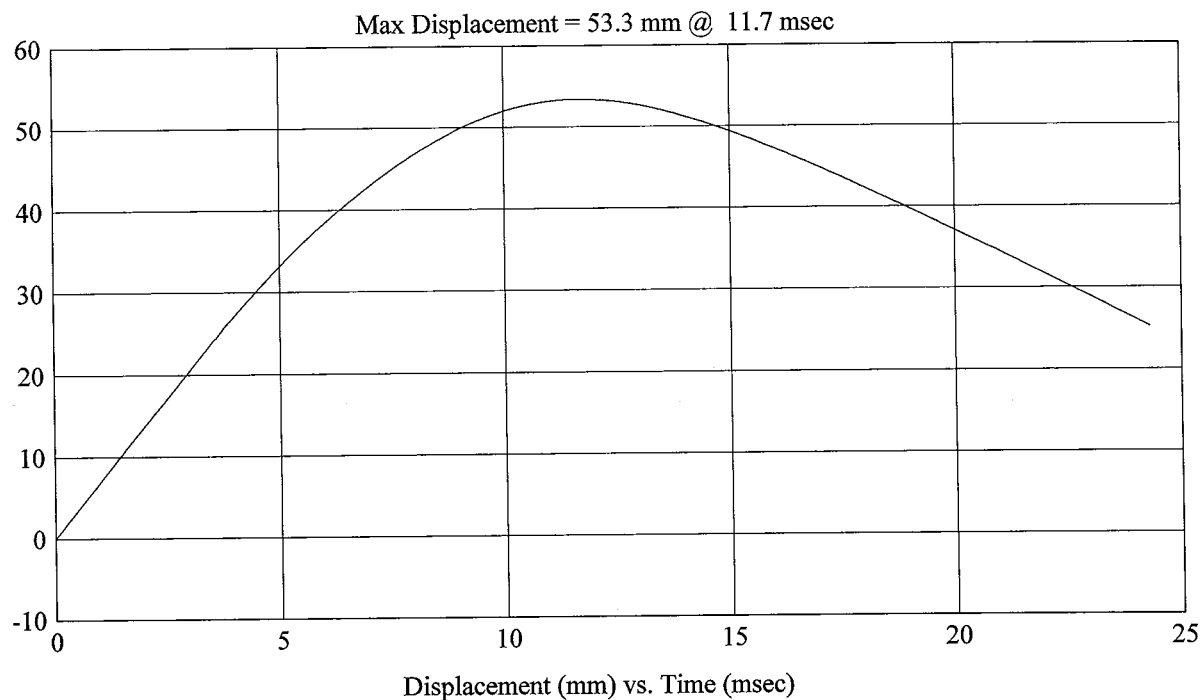
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G06I7-001.7

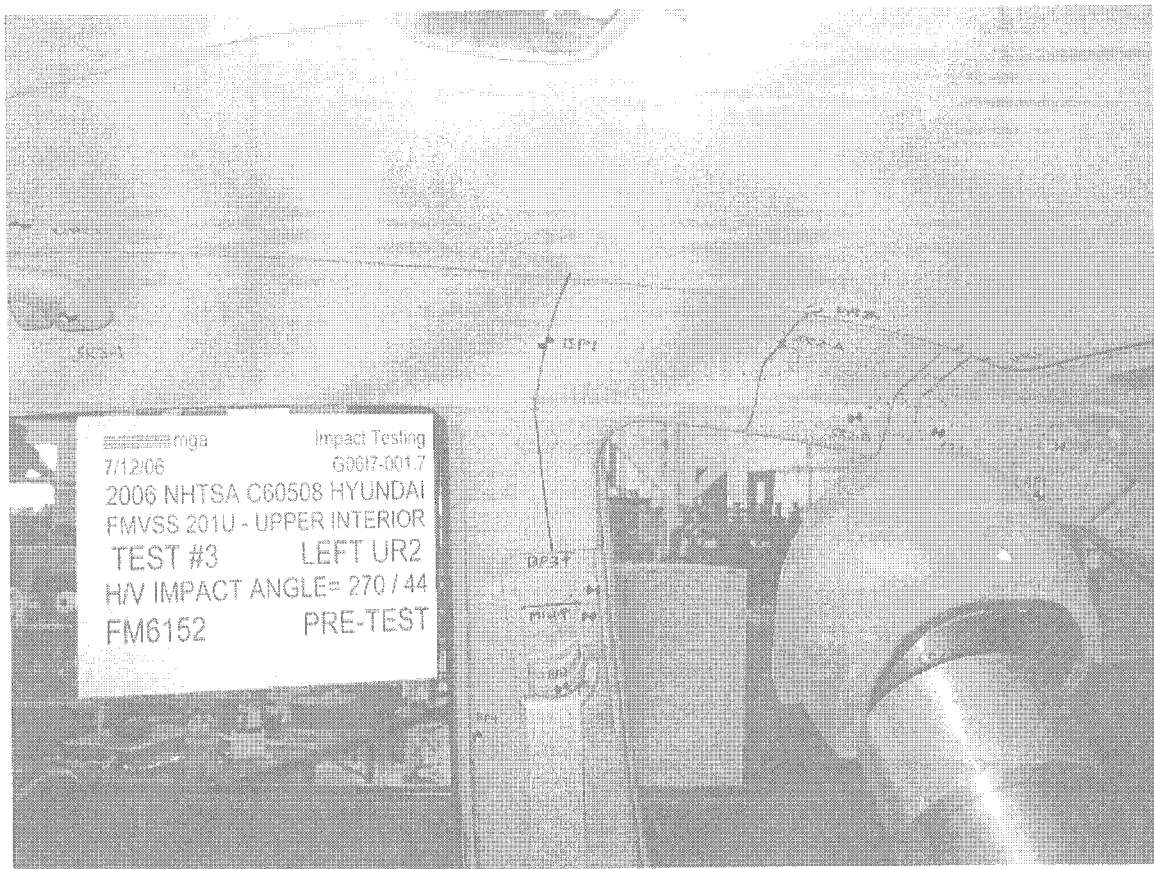
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Test # 9
FM6158
Additional Desc: N/A

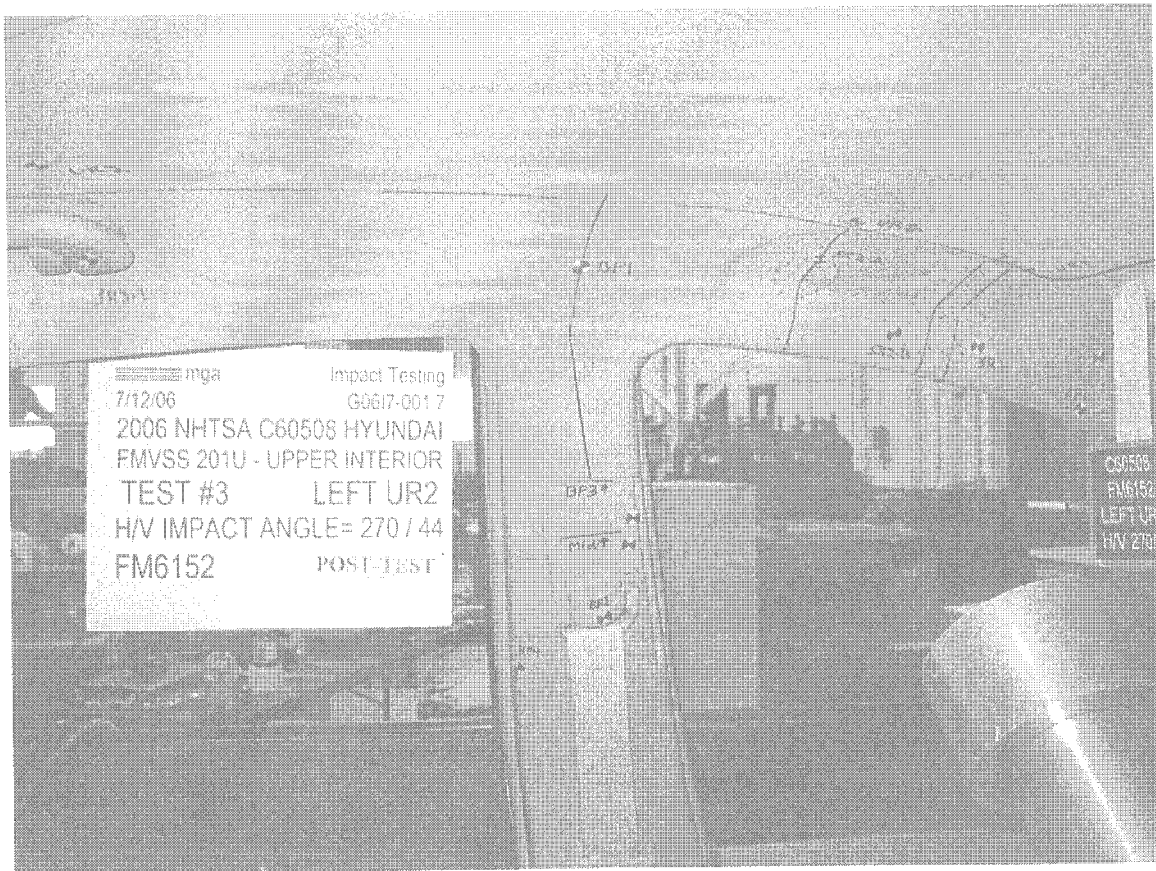
Vehicle Program : Hyundai
Test Date: 7/13/06

Model Year: 2006
Target: UR4
Vehicle Side: Right
Horz/Vert Angle: 90/50

HIC(d) = 641, HIC = 629, Delta T = 10.3 msec









SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G06I7-001.7

VEHICLE YR/MAKE/MODEL:2006/NHTSA/Hyundai

GENERAL TEST PARAMETERS:

Test Number:#3

Target (Vehicle Side): UR2Left

Temperature:24C

MGA Test Reference No.:FM6152

Humidity:54%

Approach Horizontal Angles:270°

Time of Test:1:45 PM

Approach Vertical Angles:44°

FMH Serial No:[039]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
939	1023	6.2	24.1	37	0

INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J13753	-103.6	1.54	1.54
Y	6	J22700	94.4	1.53	1.53
Z	7	J32734	95.5	1.45	1.45

REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage.

Recorded By:



Approved By*:



Date: 7/13/06

*Only necessary for NHTSA (Government) Compliance testing.

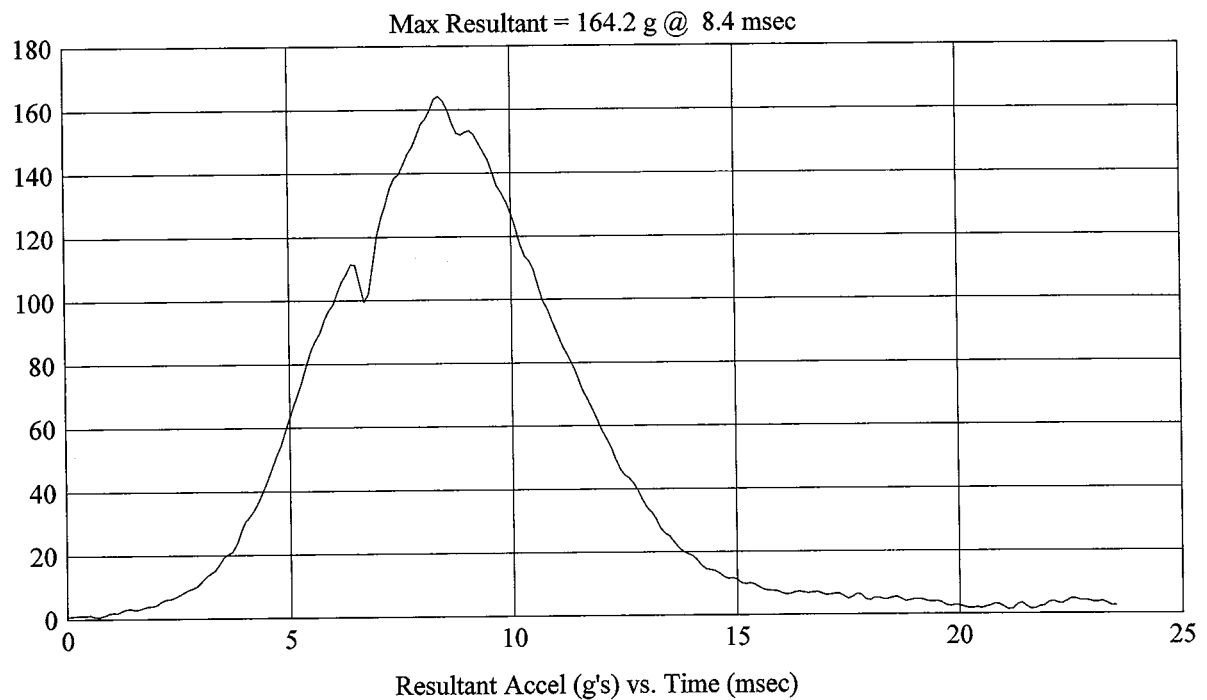
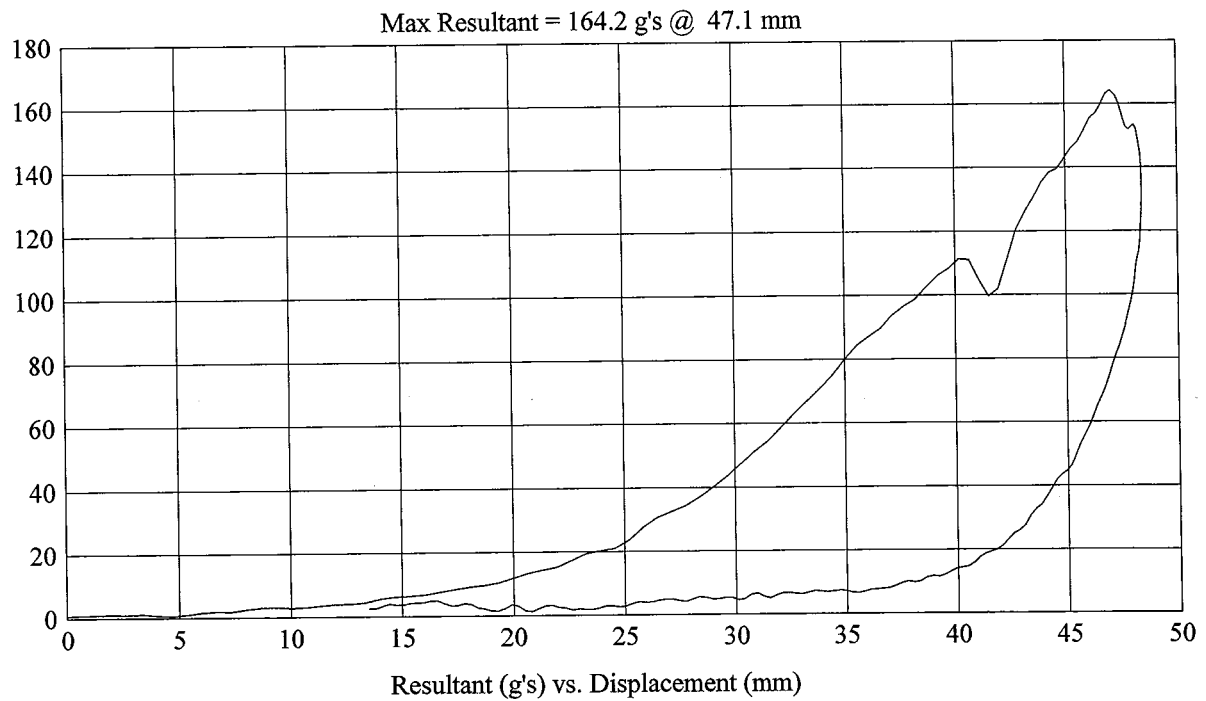
FMH
G06I7-001.7

Customer: NHTSA
Test # 3
FM6152
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/44

HIC(d) = 939, HIC = 1023, Delta T = 6.2 msec



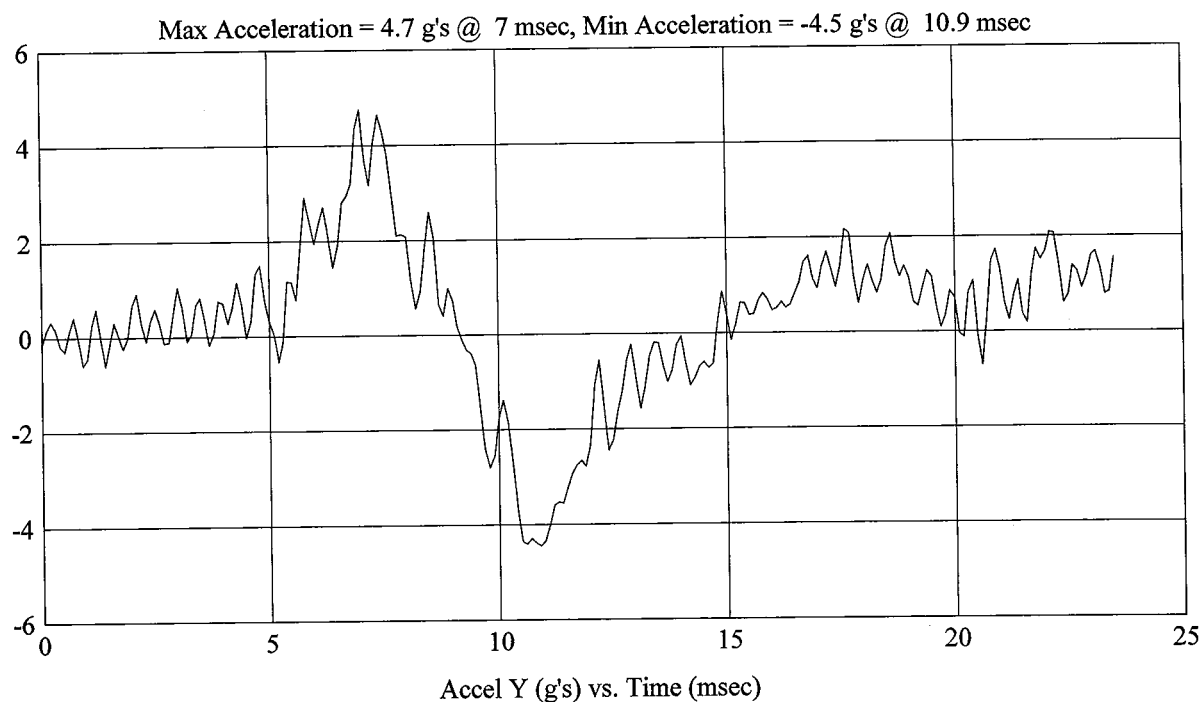
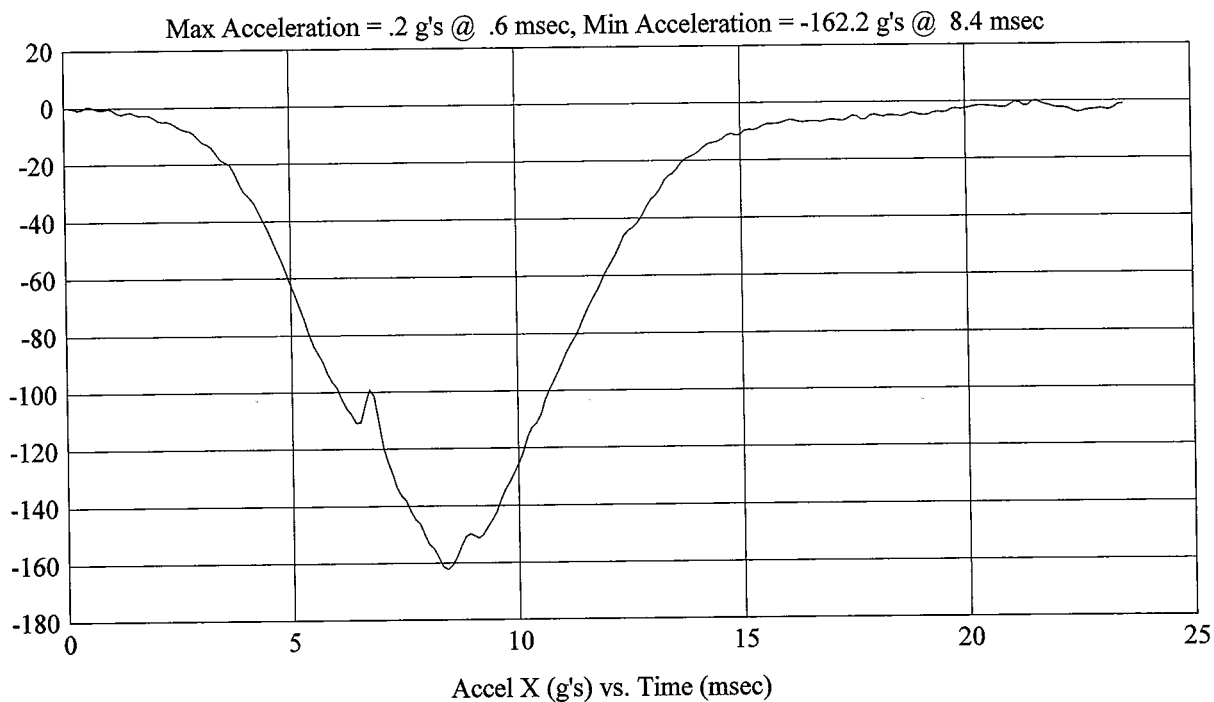
FMH
G06I7-001.7

Customer: NHTSA
Test # 3
FM6152
Additional Desc: N/A

Vehicle Program : Hyundai
Test Date: 7/12/06

Model Year: 2006
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/44

HIC(d) = 939, HIC = 1023, Delta T = 6.2 msec



FMH
G06I7-001.7

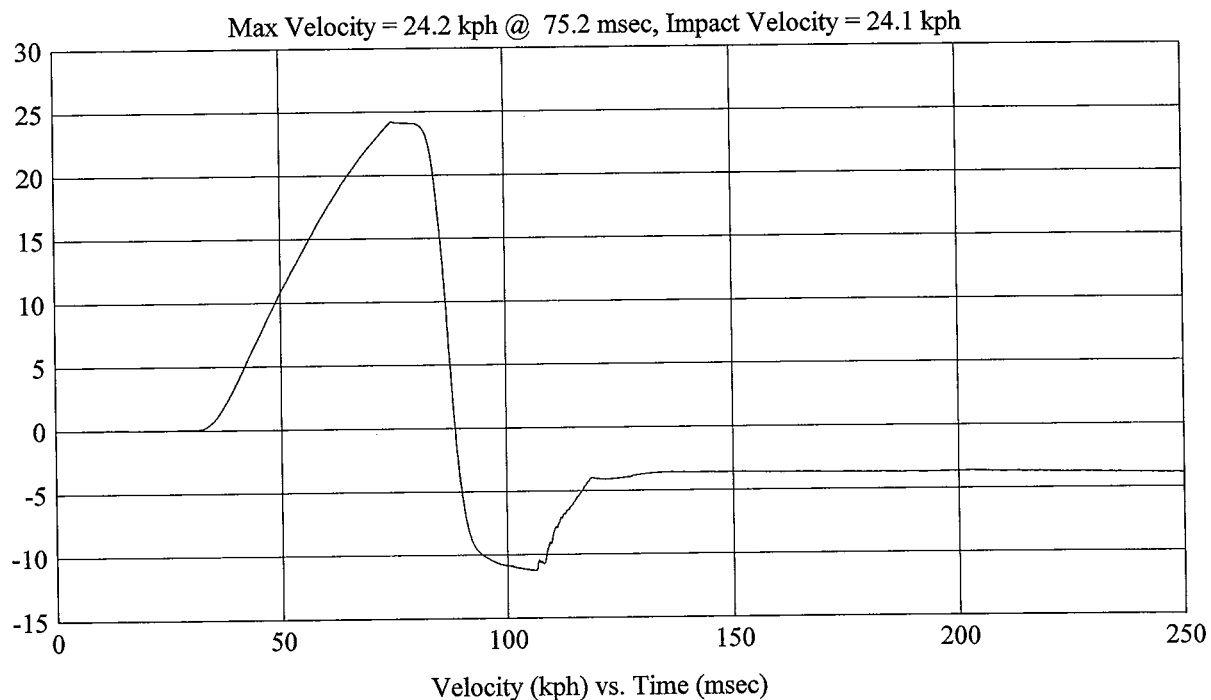
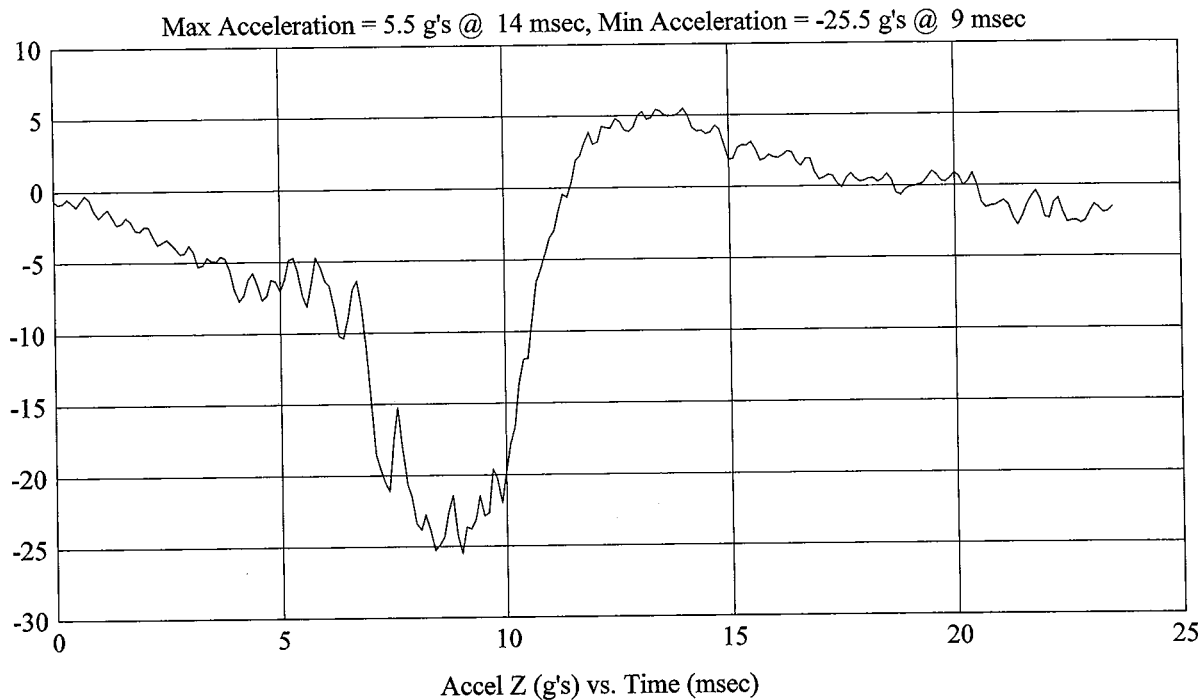
Customer: NHTSA
Test # 3
FM6152
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/44

HIC(d) = 939, HIC = 1023, Delta T = 6.2 msec



FMH
G06I7-001.7

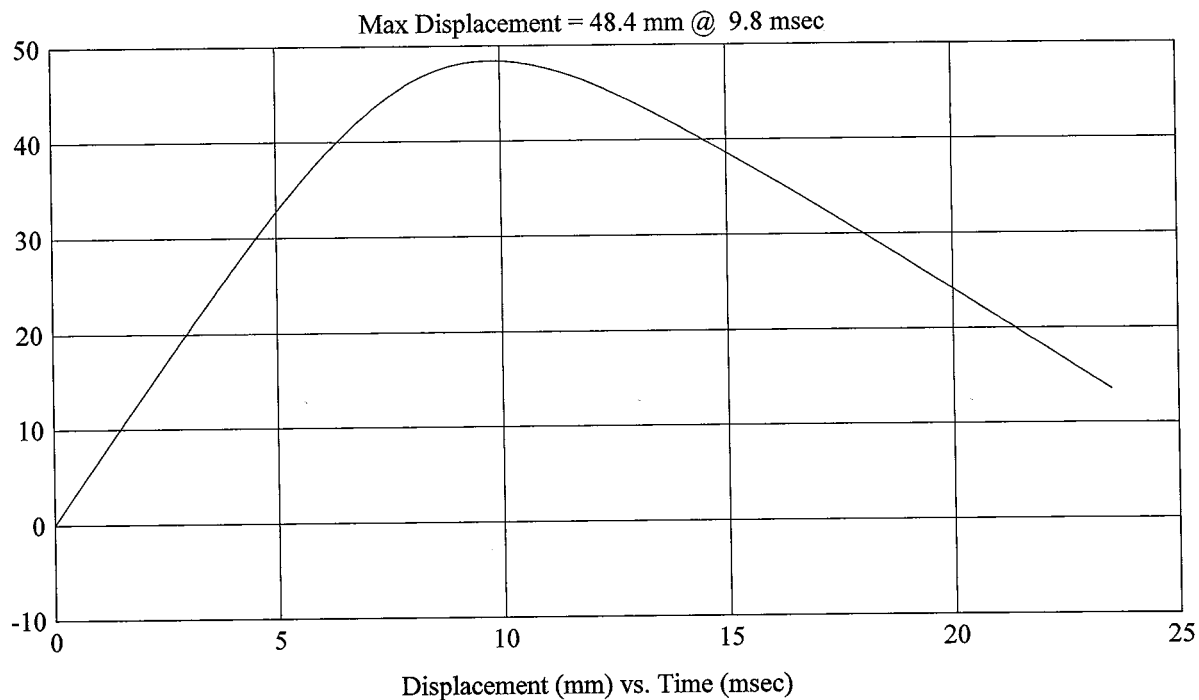
Customer: NHTSA
Test # 3
FM6152
Additional Desc: N/A

Vehicle Program : Hyundai

Test Date: 7/12/06

Model Year: 2006
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/44

HIC(d) = 939, HIC = 1023, Delta T = 6.2 msec



4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

The following section lists the test equipment for the compliance test series. Items marked with an asterisk are calibrated by an external lab. An additional summary table is given for the pre and post-test calibration data for the Free Motion Headforms. The temperature trace to confirm testing was conducted between 66°F and 78°F (19°C - 26°C) is included in Appendix A. Calibration certificates can be found in Appendix B.

TABLE 4-1 LIST OF ITEMS USED

ITEM	MANUFACTURER NAME	MODEL #	FUNCTION OF ITEM	ACCURACY	CAL. INTERNAL
Head Drop Tower (includes test frame and DAS)	MGA Research Corp.	MGA-100-DC	FMH Calibration	N/A	N/A
Accelerometers	Endevco	7264-2000	Acceleration Data	±0.5%	6 months
*Digital Inclinator	Mitutoyo	PRO 360 (MGA00048)	Set Angle of FMH/Targeting	0.1°	Annual
FMVSS 201U Test Frame (includes the propulsion control system, actuator, test frame, and DAS)	MGA Research Corp.	MGA-100-FMH	Test System	N/A	N/A
Free Motion Headforms	UTAMA UTAMA UTAMA	035 038 039	Test Device	N/A	Pre and Post-Test Series
High Speed Video	Redlake	HGLE	Record Event	N/A	N/A
*FARO™	Faro Technologies	S08059801273	Targeting	0.1 mm	Annual
Measuring Devices: - Tape Measure - Plumb Bobs - Digital Protractor	Stanley N/A Mitutoyo	675 -- MGA00048	Measurement Targeting FMH setup Horizontal Measurement	1 mm N/A 0.5°	Annual
*Vehicle Scale	SW Scales	26032389	Weighing Vehicle	± .5 kg	Annual
* Scale	Ohaus	1264112535330P	Weigh FMH Head	± 0.01 lb	Annual
*Temperature Recorder	Dickson	TM-325 (MGA00146)	Record Temperature and Humidity	± 1°C ± 1% RH	Annual

TABLE 4-2 FMH CALIBRATION SUMMARY DATA SUMMARY TABLE

FMH Serial #		Weight (lbs)	Temp (°C)	% Humidity	Peak Resultant Acceleration (G's)	Peak Lateral Acceleration (G's)	Unimodal
Pre	#35	10.02	24.0	56.0	244.7	12.7	Yes
Post	#35	10.02	22.0	44.0	247.2	5.0	Yes
Pre	#38	9.92	24.0	56.0	258.7	8.9	Yes
Post	#38	9.92	22.0	44.0	260.6	7.1	Yes
Pre	#39	10.00	24.0	49.0	258.2	9.1	Yes
Post	#39	10.00	22.0	44.0	246.1	3.1	Yes

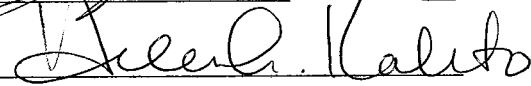
RECORDED BY: Matt KerrDATE: July 14, 2007APPROVED BY: Helen A. Kaleto

HEAD DROP TEST SUMMARY PART 572L

HEADFORM SERIAL NUMBER: <u>035</u>		CALIBRATION DATE: <u>07/11/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	10.02
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	56
Peak Resultant Acceleration	225 G's to 275 G's	244.7
Peak Lateral Acceleration	15 G's Maximum	12.7
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J35924	04/06/06	10/06/06
2	ENDEVCO	7264-2000	J35919	04/06/06	10/06/06
3	ENDEVCO	7264-2000	J22664	04/06/06	10/06/06

REMARKS:

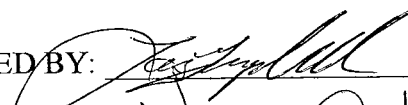
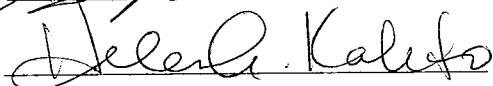
RECORDED BY:  DATE: 07/11/2006APPROVED BY: 

HEAD DROP TEST SUMMARY PART 572L

HEADFORM SERIAL NUMBER: <u>035</u>		CALIBRATION DATE: <u>07/14/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	10.02
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	44
Peak Resultant Acceleration	225 G's to 275 G's	247.2
Peak Lateral Acceleration	15 G's Maximum	5.0
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J35924	04/06/06	10/06/06
2	ENDEVCO	7264-2000	J35919	04/06/06	10/06/06
3	ENDEVCO	7264-2000	J22664	04/06/06	10/06/06

REMARKS:

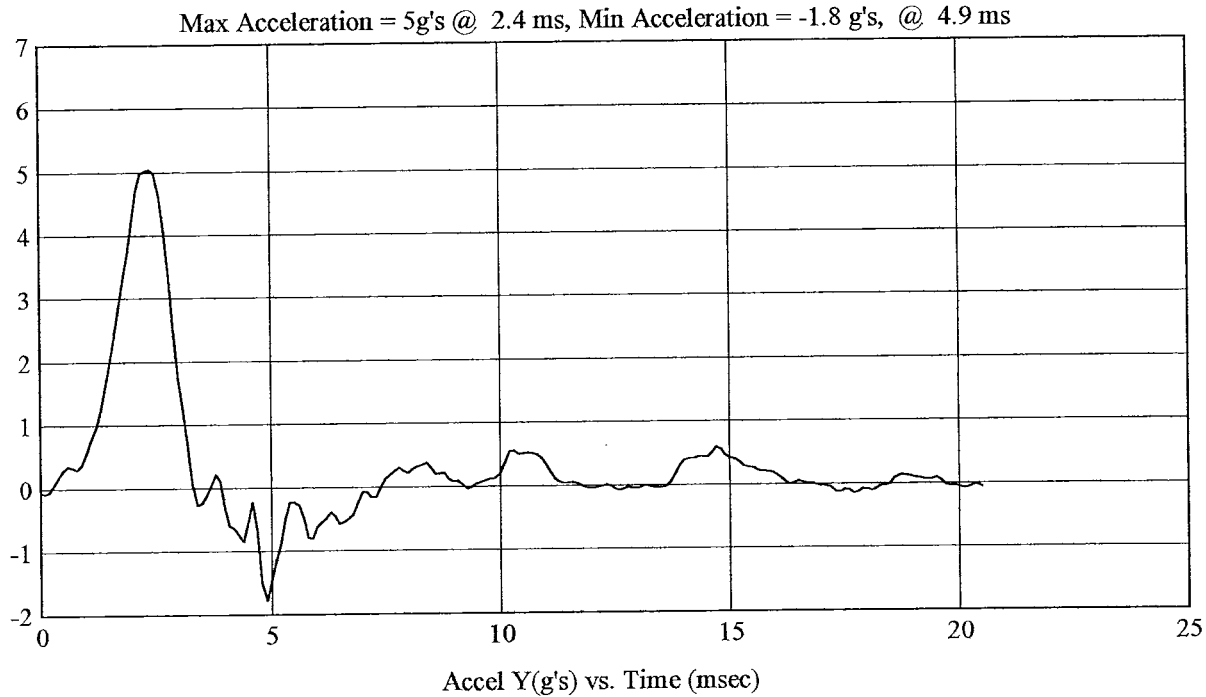
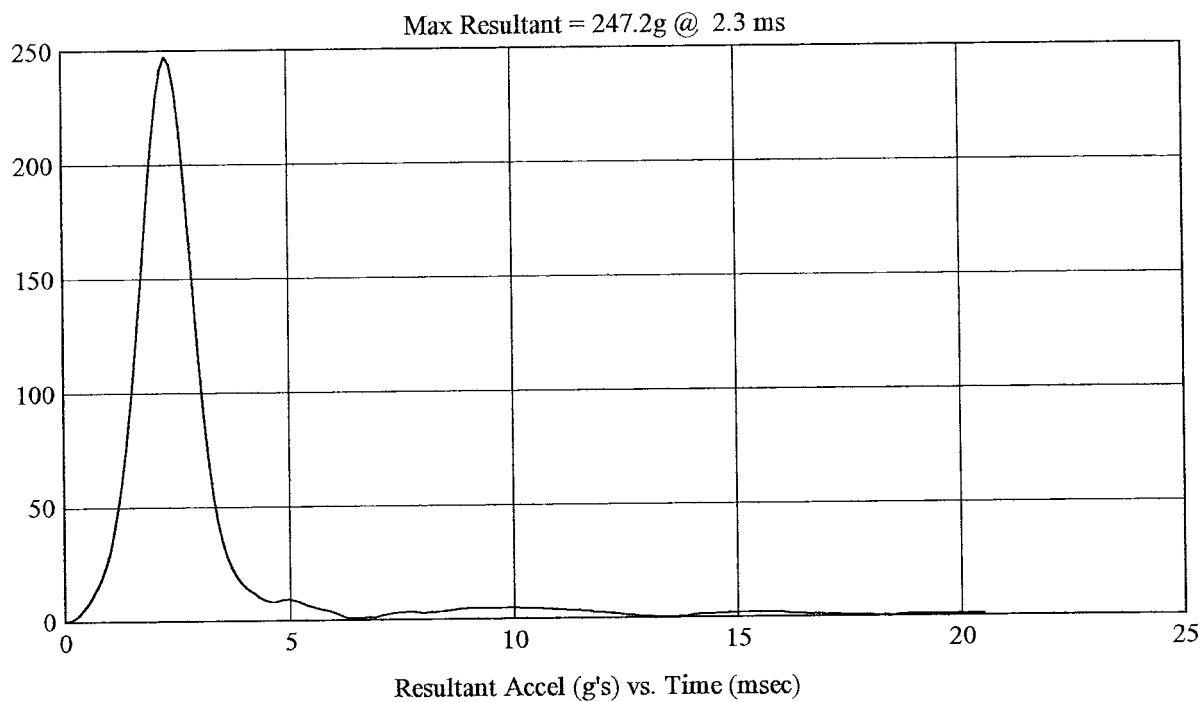
RECORDED BY:  DATE: 07/14/2006APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H35322
Test Description: Post

MGA Job Number: G0617-001.7

Test Date: 07/14/2006
Head #: 035

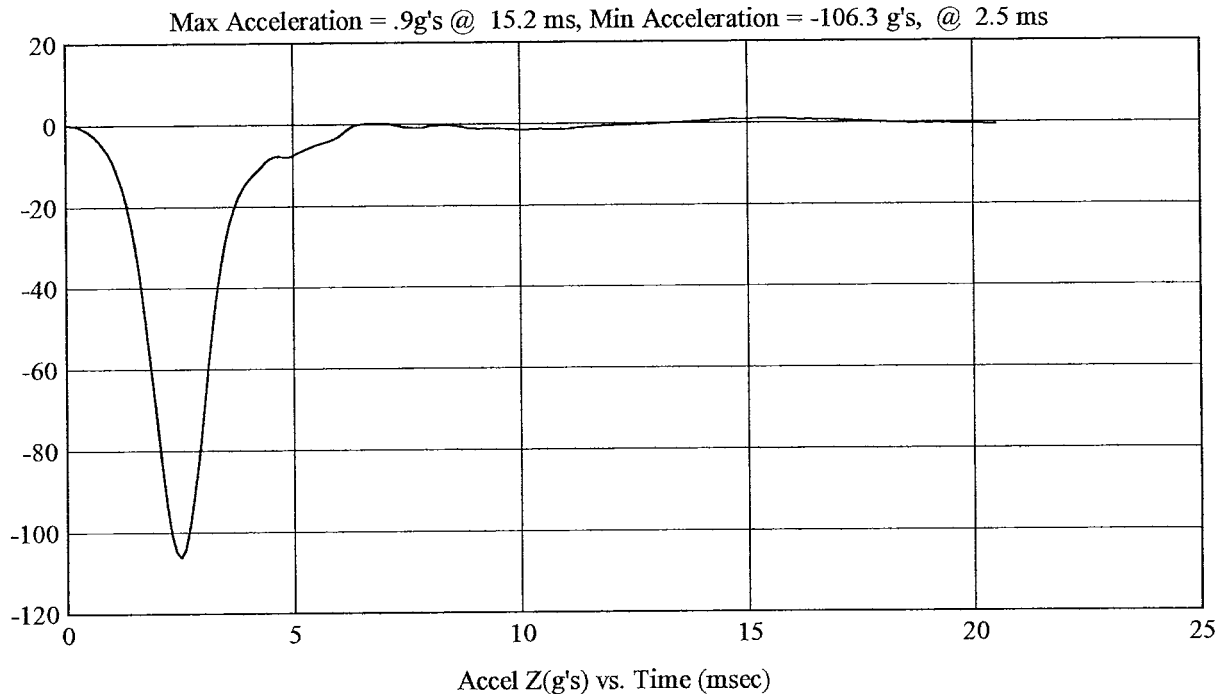
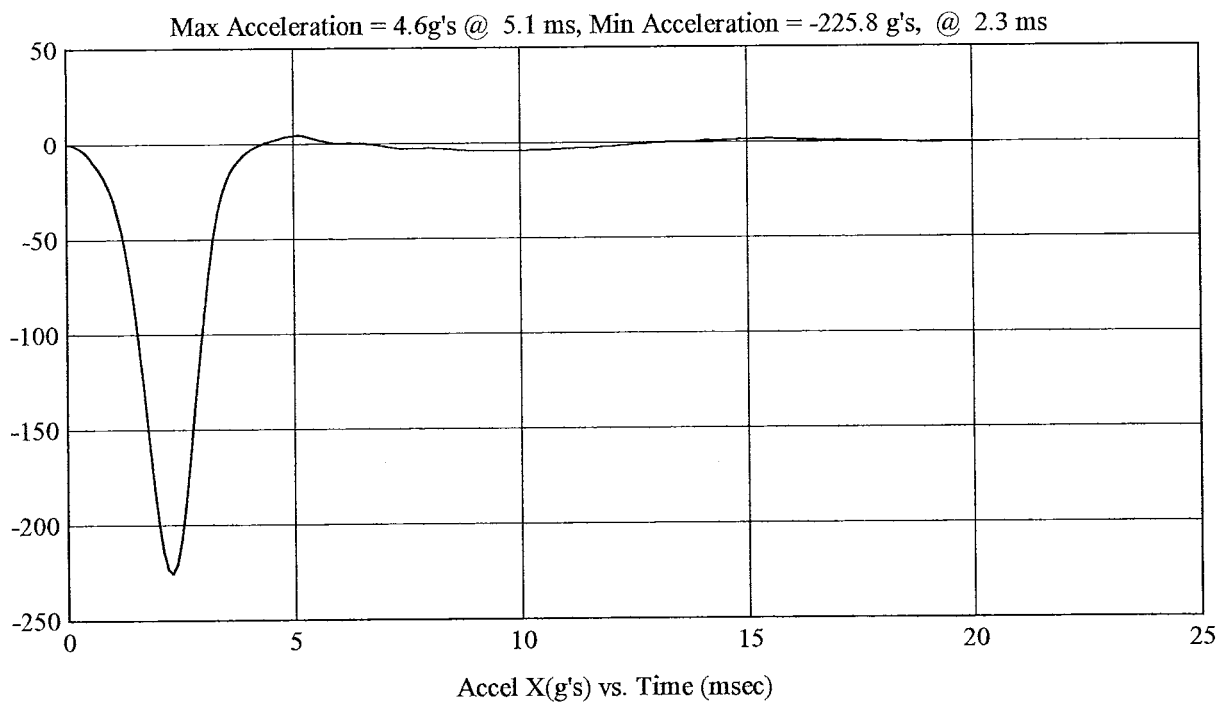


Head Drop
(Preliminary Test Report)

Test Number: H35322
Test Description: Post

MGA Job Number: G06I7-001.7

Test Date: 07/14/2006
Head #: 035

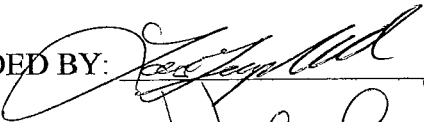


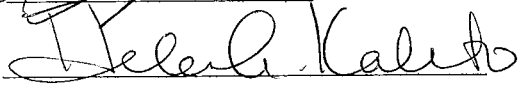
HEAD DROP TEST SUMMARY **PART 572L**

HEADFORM SERIAL NUMBER: <u>038</u>		CALIBRATION DATE: <u>07/11/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	9.92
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	56
Peak Resultant Acceleration	225 G's to 275 G's	258.7
Peak Lateral Acceleration	15 G's Maximum	8.9
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J36197	04/07/06	10/07/06
2	ENDEVCO	7264-2000	J36193	04/07/06	10/07/06
3	ENDEVCO	7264-2000	J36353	04/07/06	10/07/06

REMARKS:

RECORDED BY:  DATE: 07/11/2006

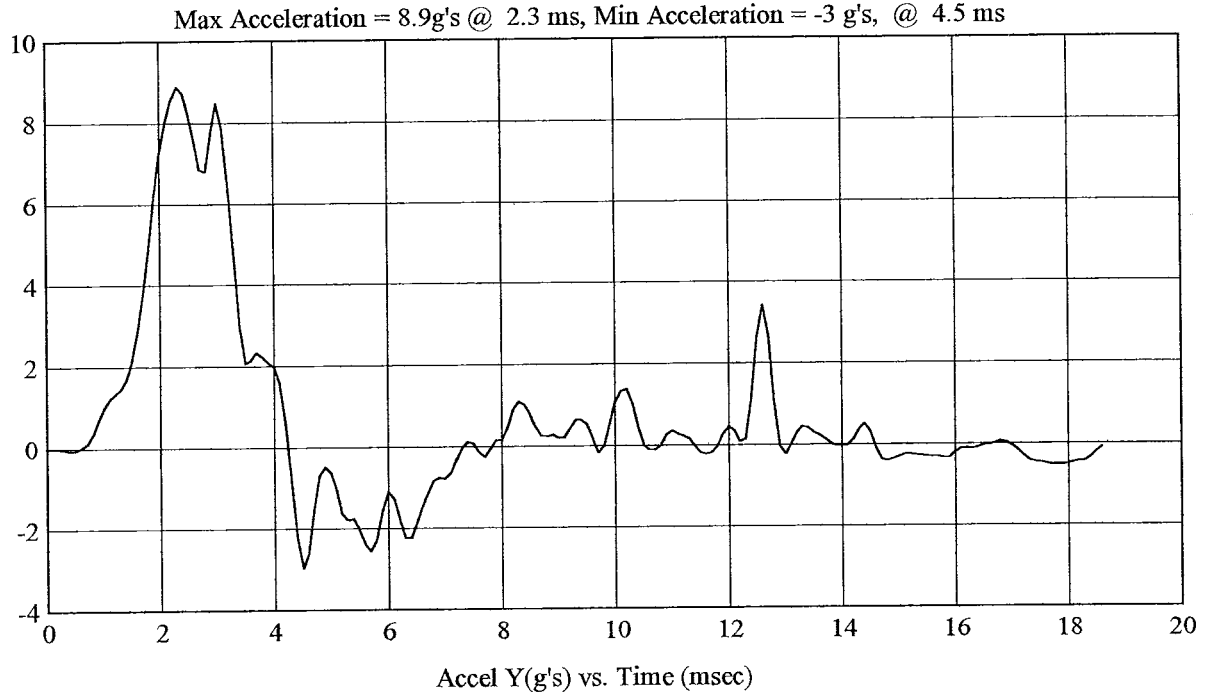
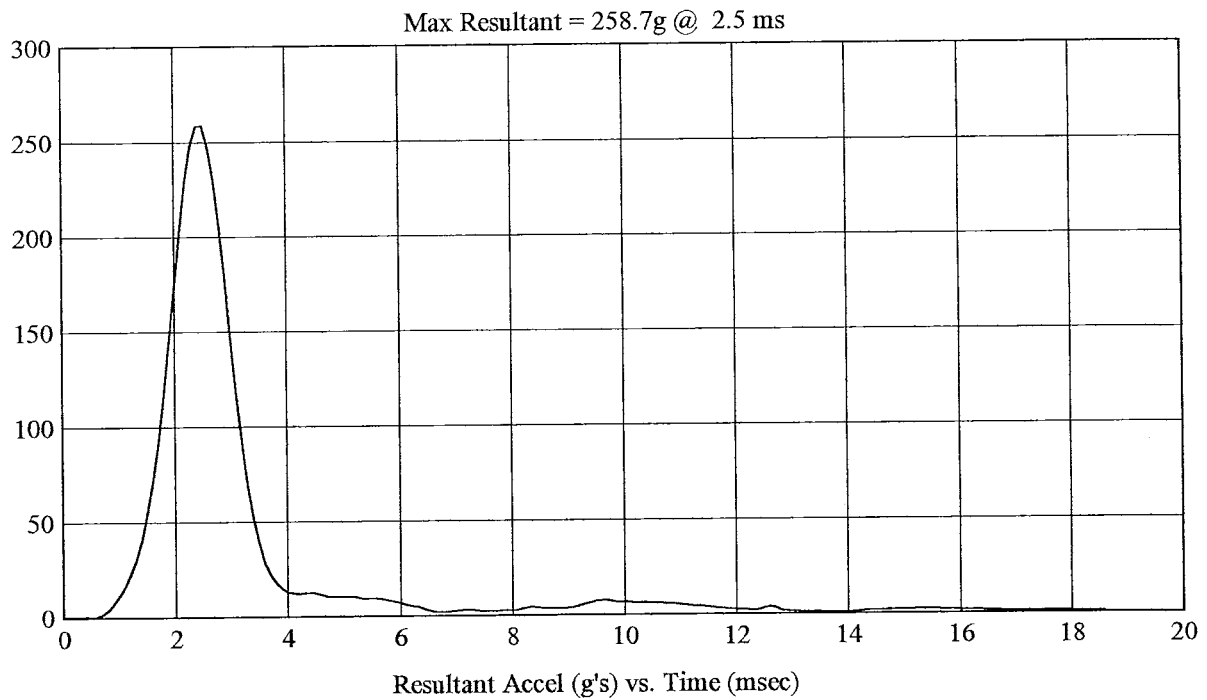
APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H38298
Test Description: Pre

MGA Job Number: G06I7-001.7

Test Date: 07/11/2006
Head #: 038

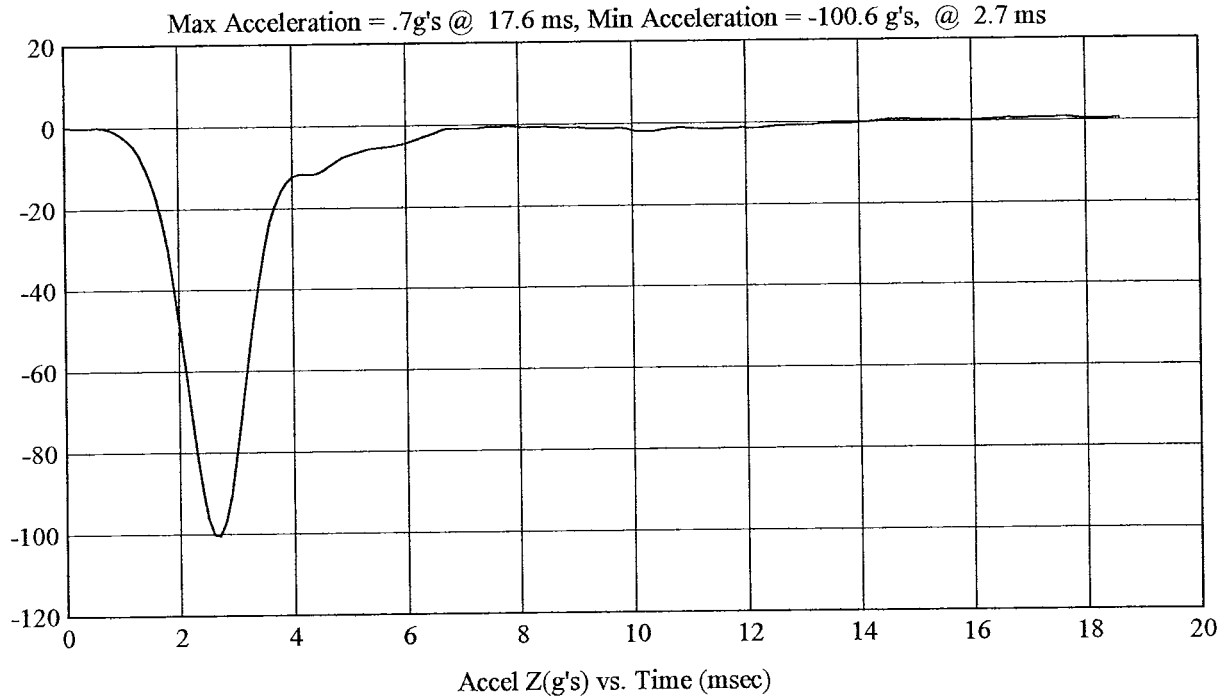
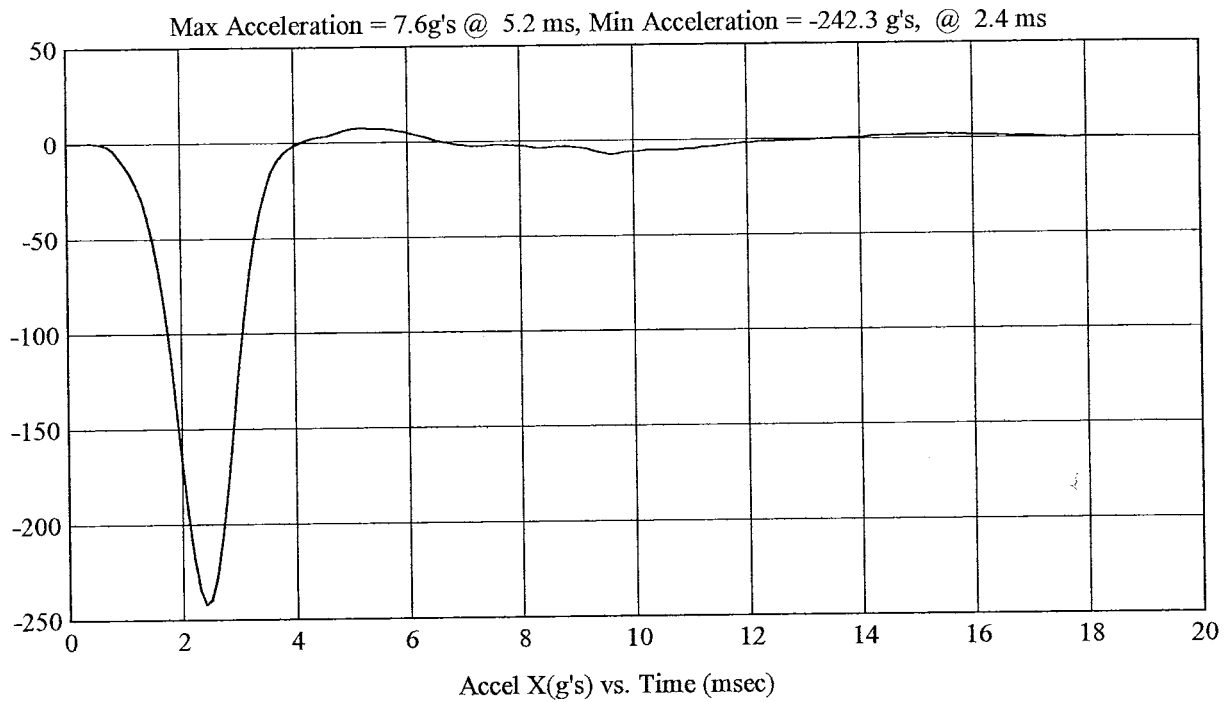


Head Drop
(Preliminary Test Report)

Test Number: H38298
Test Description: Pre

MGA Job Number: G06I7-001.7

Test Date: 07/11/2006
Head #: 038

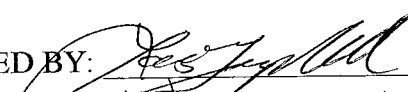


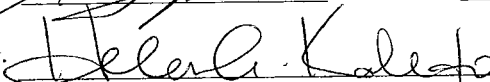
HEAD DROP TEST SUMMARY **PART 572L**

HEADFORM SERIAL NUMBER: <u>038</u>		CALIBRATION DATE: <u>07/14/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	9.92
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	44
Peak Resultant Acceleration	225 G's to 275 G's	260.6
Peak Lateral Acceleration	15 G's Maximum	7.1
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J36197	04/07/06	10/07/06
2	ENDEVCO	7264-2000	J36193	04/07/06	10/07/06
3	ENDEVCO	7264-2000	J36353	04/07/06	10/07/06

REMARKS:

RECORDED BY:  DATE: 07/14/2006

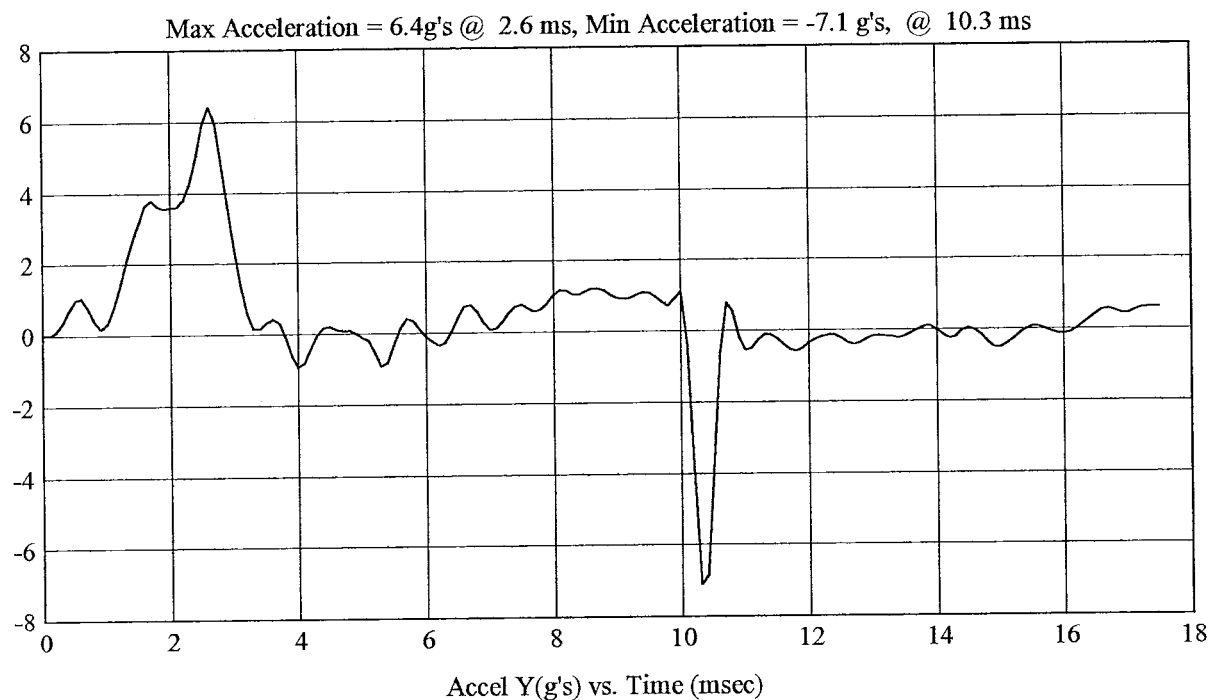
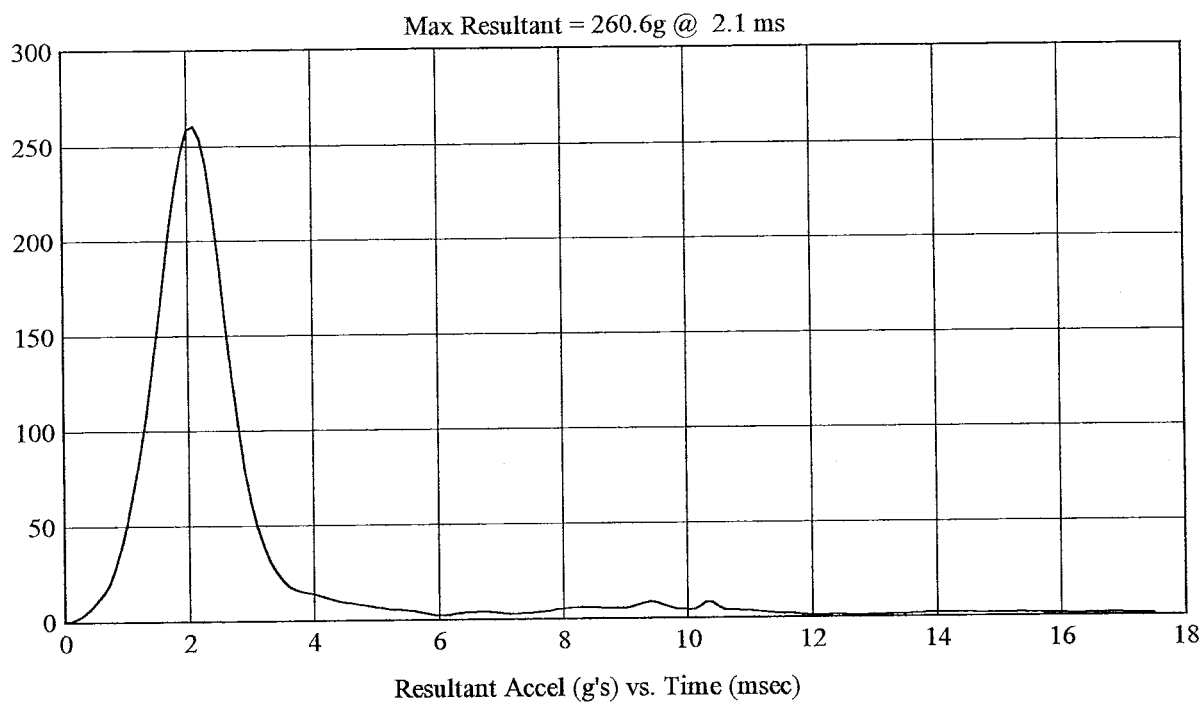
APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H38299
Test Description: Post

MGA Job Number: G06I7-001.7

Test Date: 07/14/2006
Head #: 038

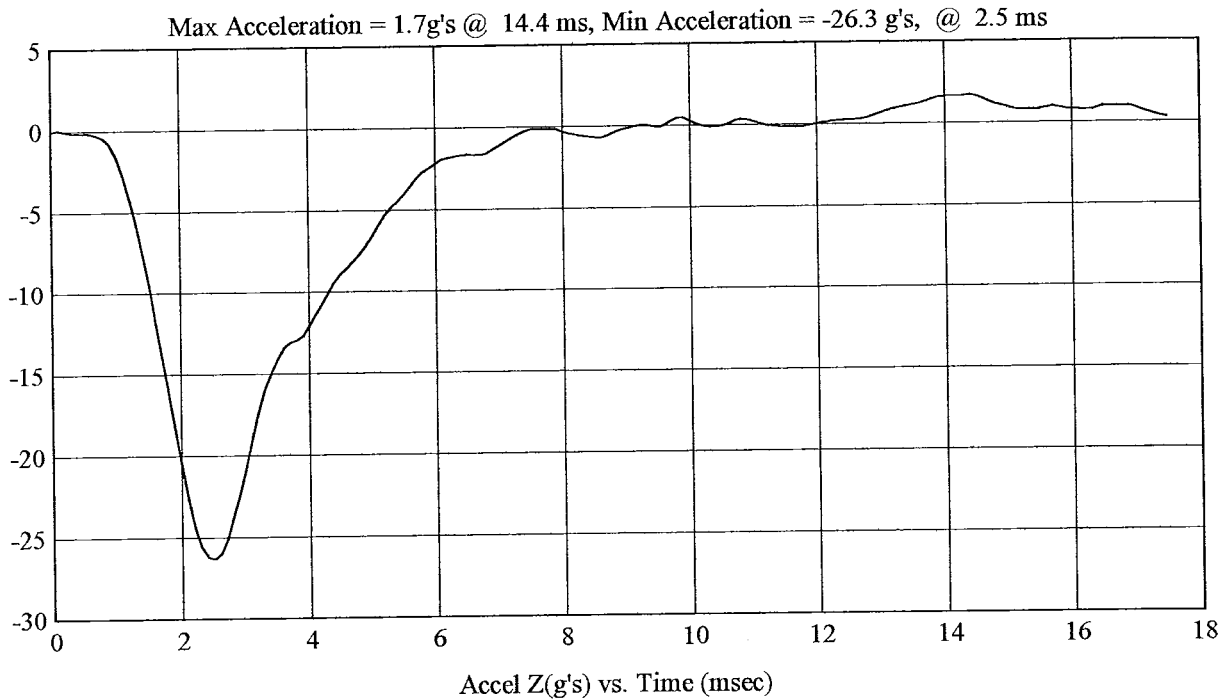
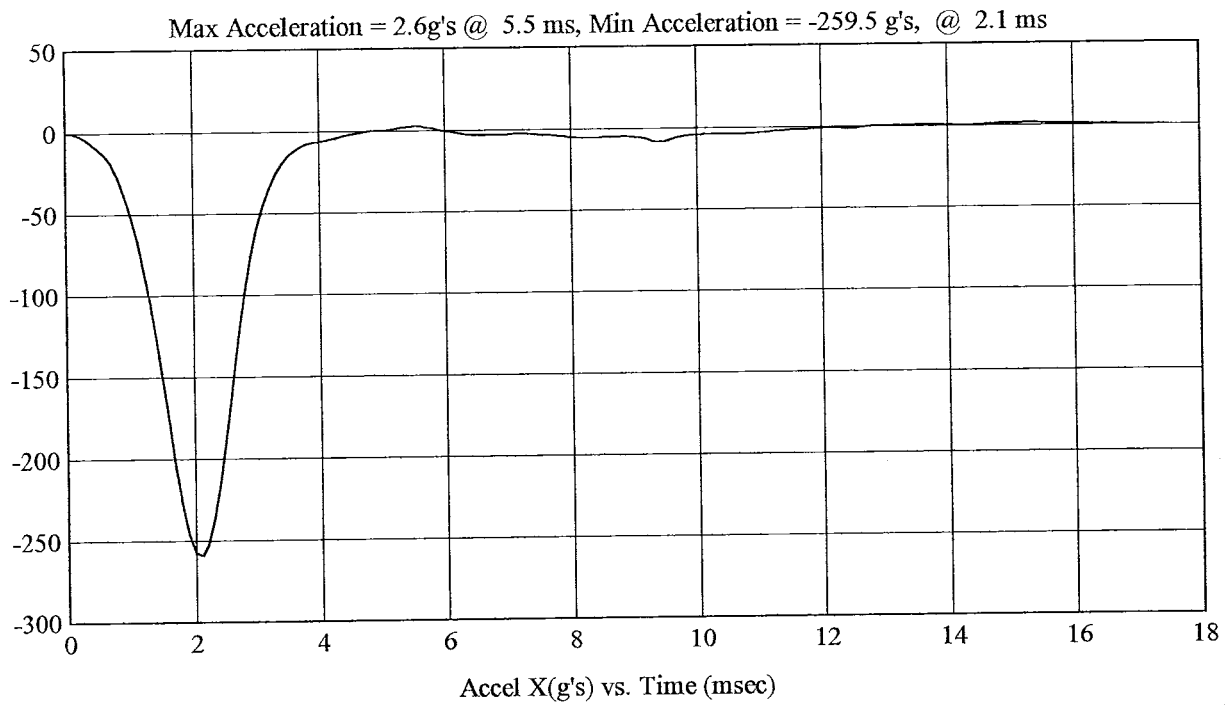


Head Drop
(Preliminary Test Report)

Test Number: H38299
Test Description: Post

MGA Job Number: G06I7-001.7

Test Date: 07/14/2006
Head #: 038



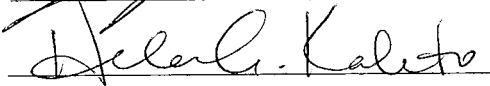
HEAD DROP TEST SUMMARY **PART 572L**

HEADFORM SERIAL NUMBER: <u>39</u>		CALIBRATION DATE: <u>07/11/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	10.00
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	49
Peak Resultant Acceleration	225 G's to 275 G's	258.2
Peak Lateral Acceleration	15 G's Maximum	9.1
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J13753	04/07/06	10/07/06
2	ENDEVCO	7264-2000	J22700	04/07/06	10/07/06
3	ENDEVCO	7264-2000	J32734	04/07/06	10/07/06

REMARKS:

RECORDED BY:  DATE: 07/11/2006

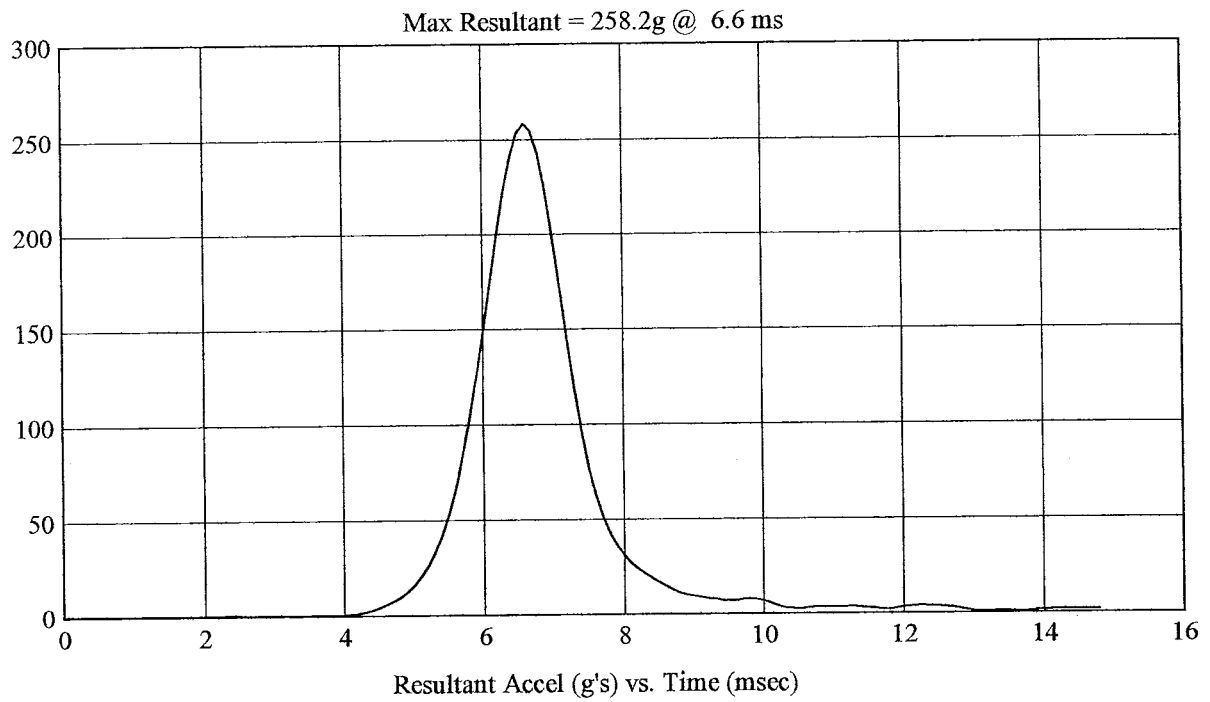
APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H39009
Test Description: 10.00

MGA Job Number: G06I7-001.7

Test Date: 07/11/2006
Head #: 39

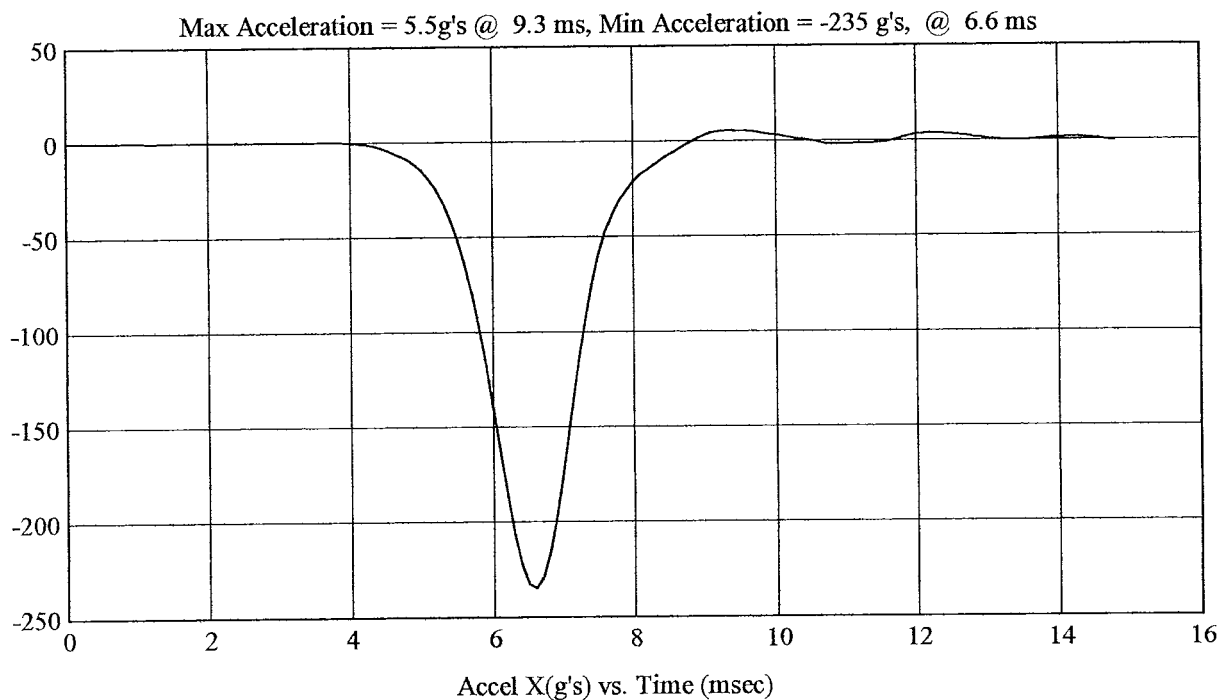
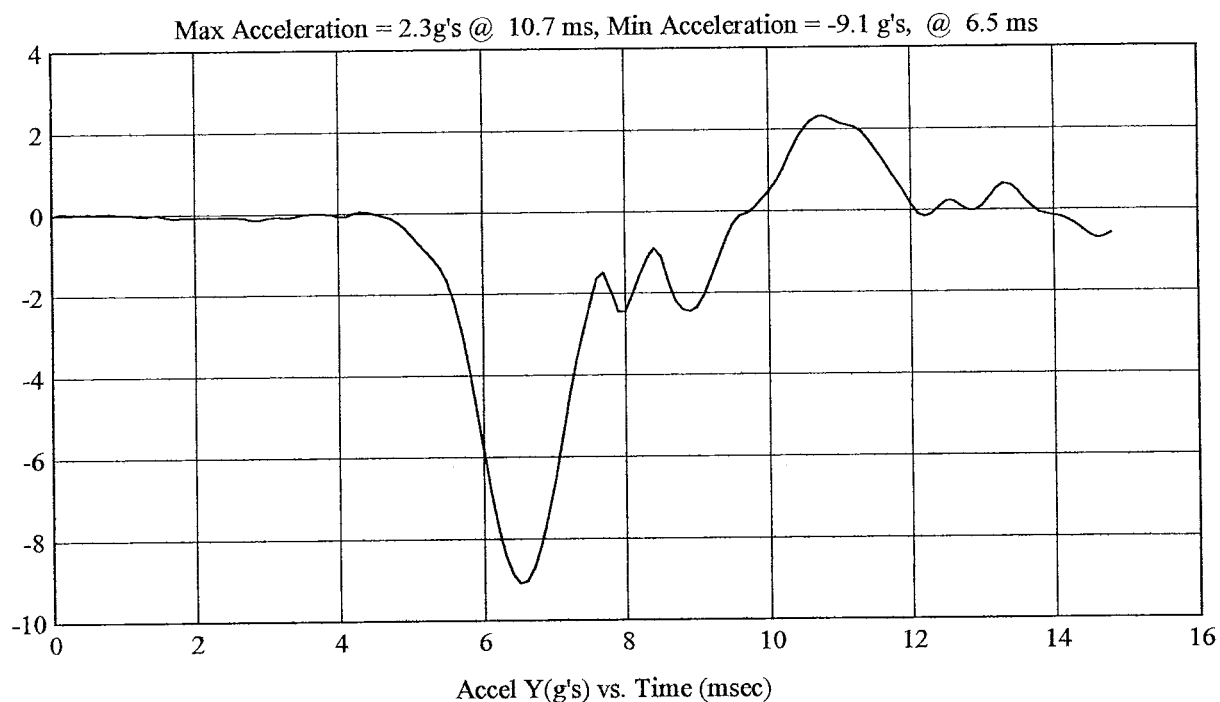


Head Drop
(Preliminary Test Report)

Test Number: H39009
Test Description: 10.00

MGA Job Number: G06I7-001.7

Test Date: 07/11/2006
Head #: 39

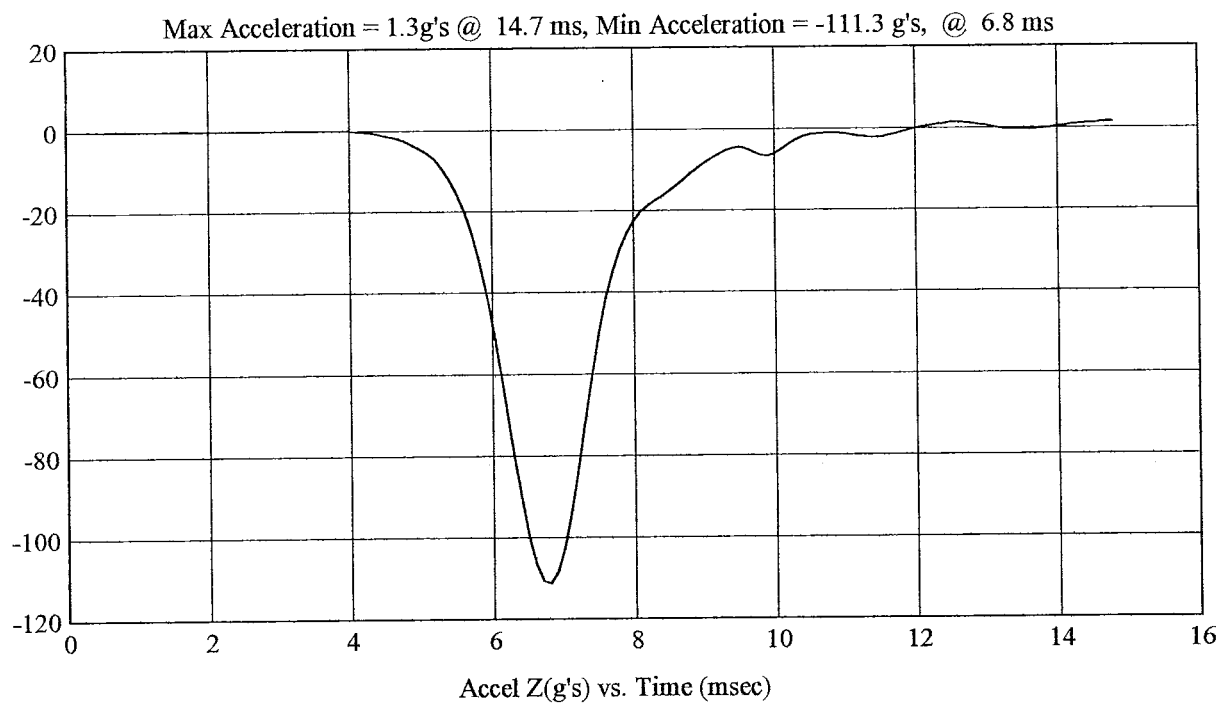


Head Drop
(Preliminary Test Report)

Test Number: H39009
Test Description: 10.00

MGA Job Number: G06I7-001.7

Test Date: 07/11/2006
Head # : 39

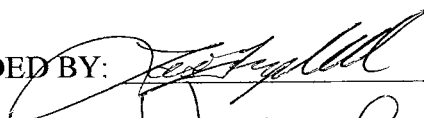


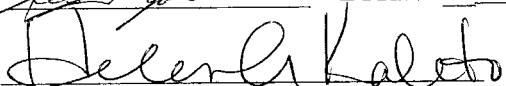
HEAD DROP TEST SUMMARY **PART 572L**

HEADFORM SERIAL NUMBER: <u>039</u>		CALIBRATION DATE: <u>07/14/2006</u>
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	10.00
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	44
Peak Resultant Acceleration	225 G's to 275 G's	246.1
Peak Lateral Acceleration	15 G's Maximum	3.1
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J13753	04/07/06	10/07/06
2	ENDEVCO	7264-2000	J22700	04/07/06	10/07/06
3	ENDEVCO	7264-2000	J32734	04/07/06	10/07/06

REMARKS:

RECORDED BY:  DATE: 07/14/2006

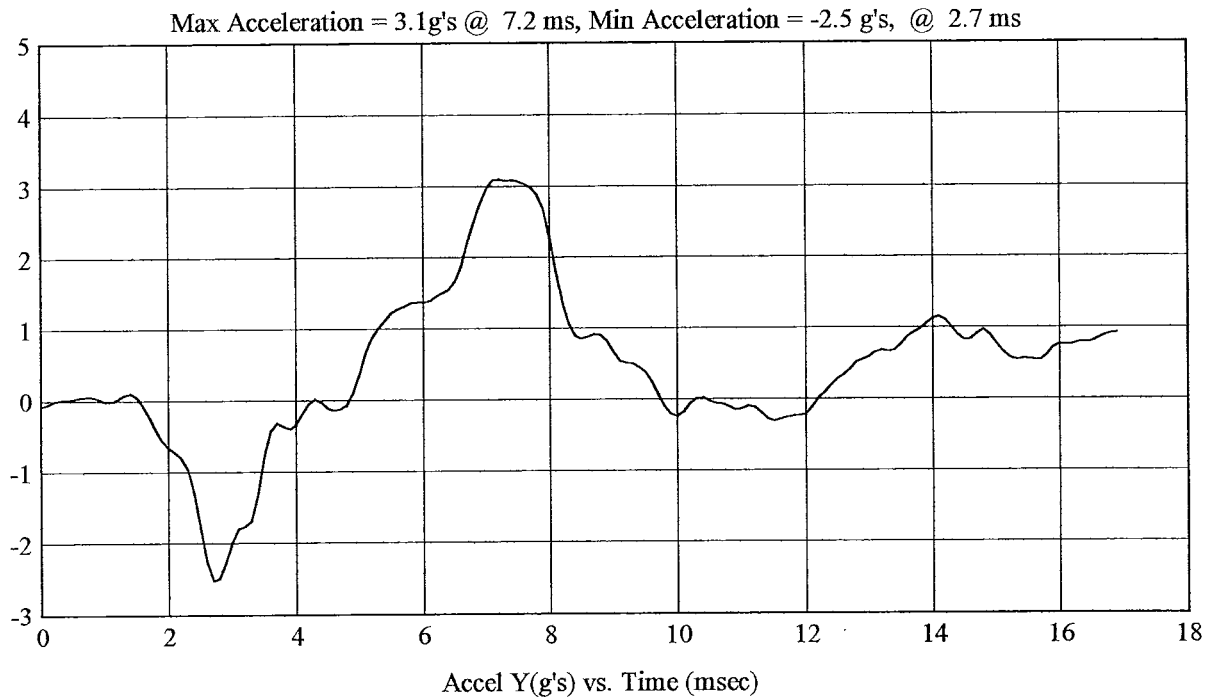
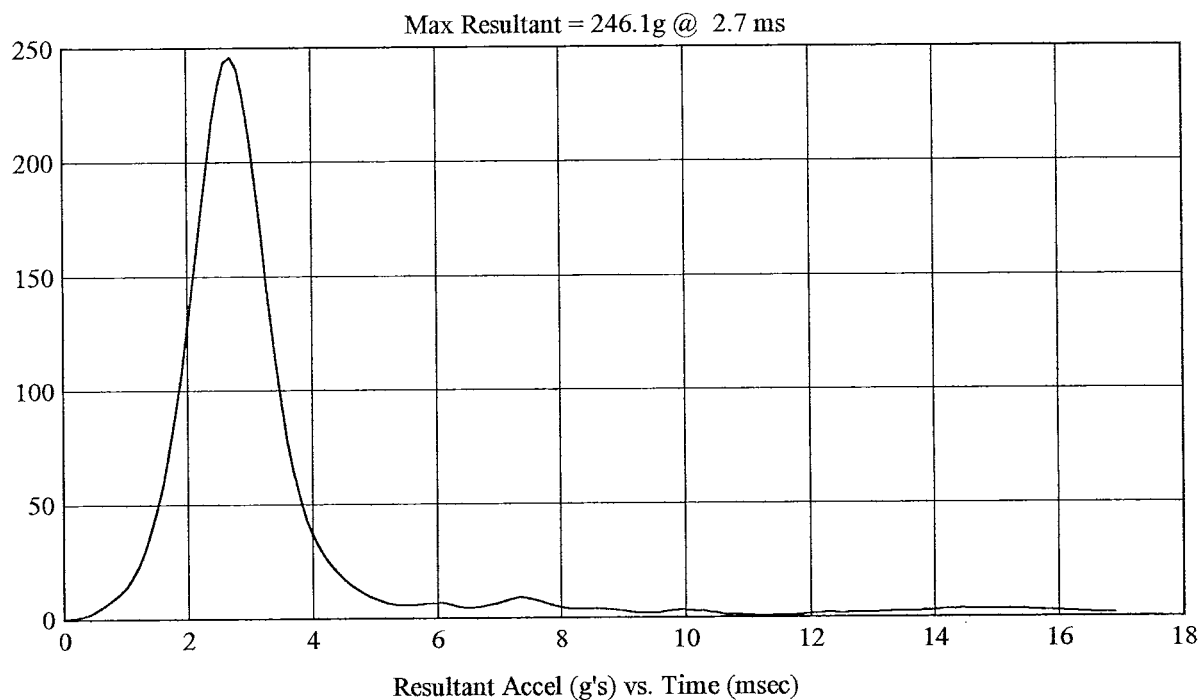
APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H39010
Test Description: Post

MGA Job Number: G06I7-001.7

Test Date: 07/14/2006
Head # : 039

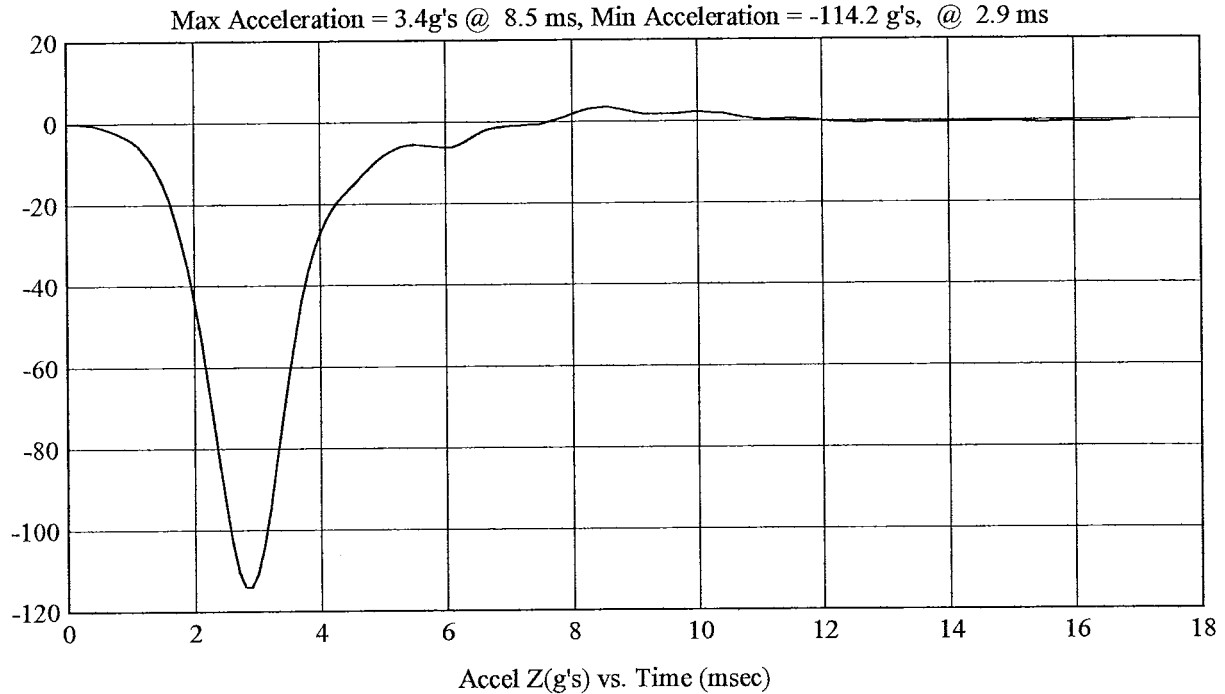
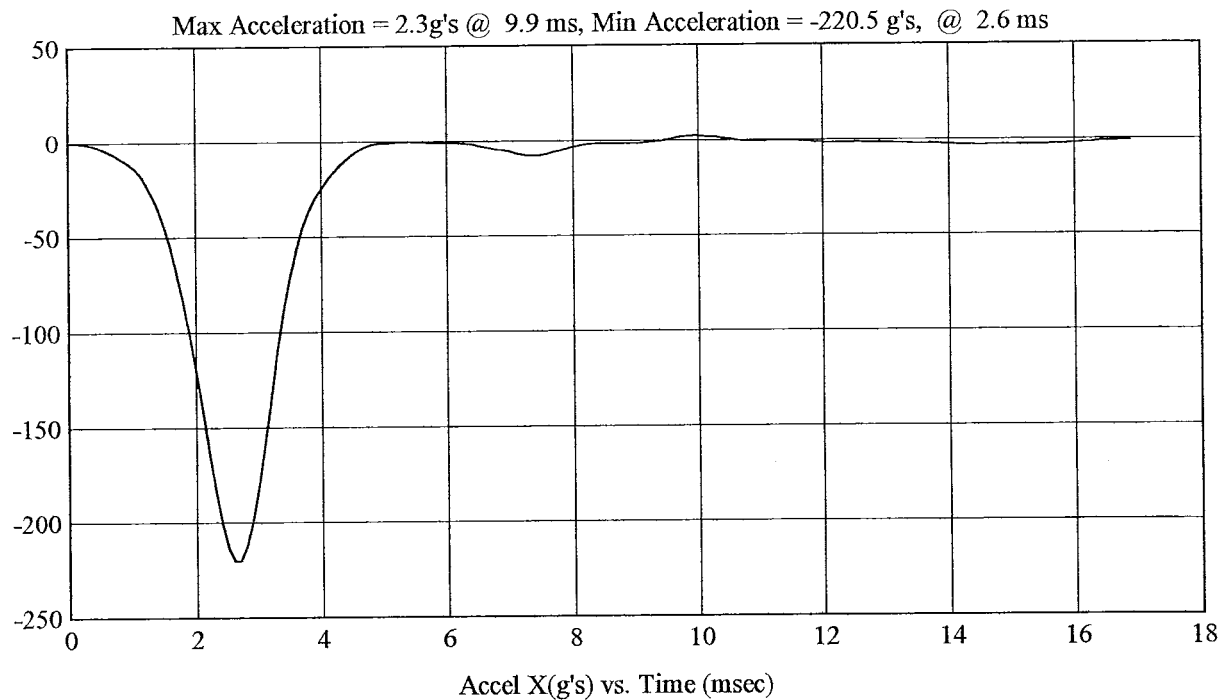


Head Drop
(Preliminary Test Report)

Test Number: H39010
Test Description: Post

MGA Job Number: G06I7-001.7

Test Date: 07/14/2006
Head #: 039



SECTION 5.0
PHOTOGRAPHS

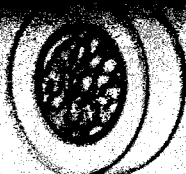
AS DELIVERED











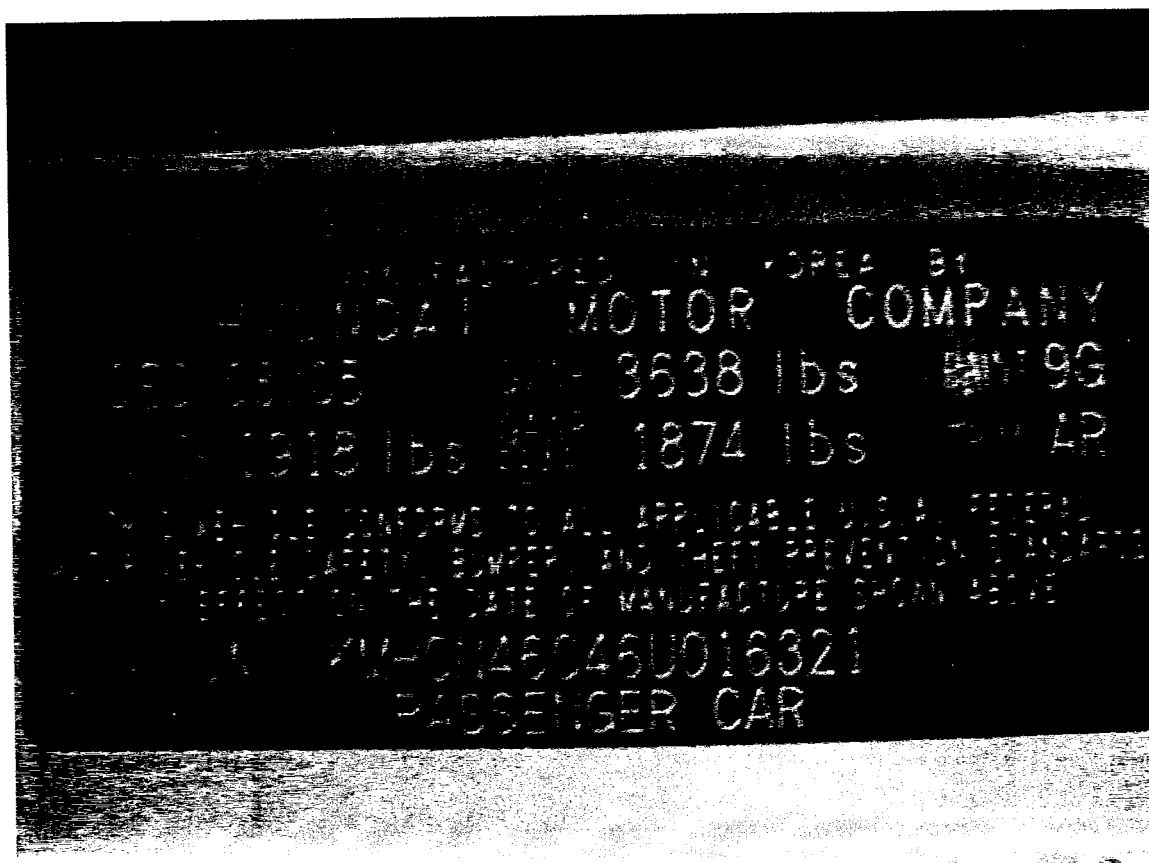
TIRE AND LOADING INFORMATION PNEUS ET CHARGE-INFORMATION

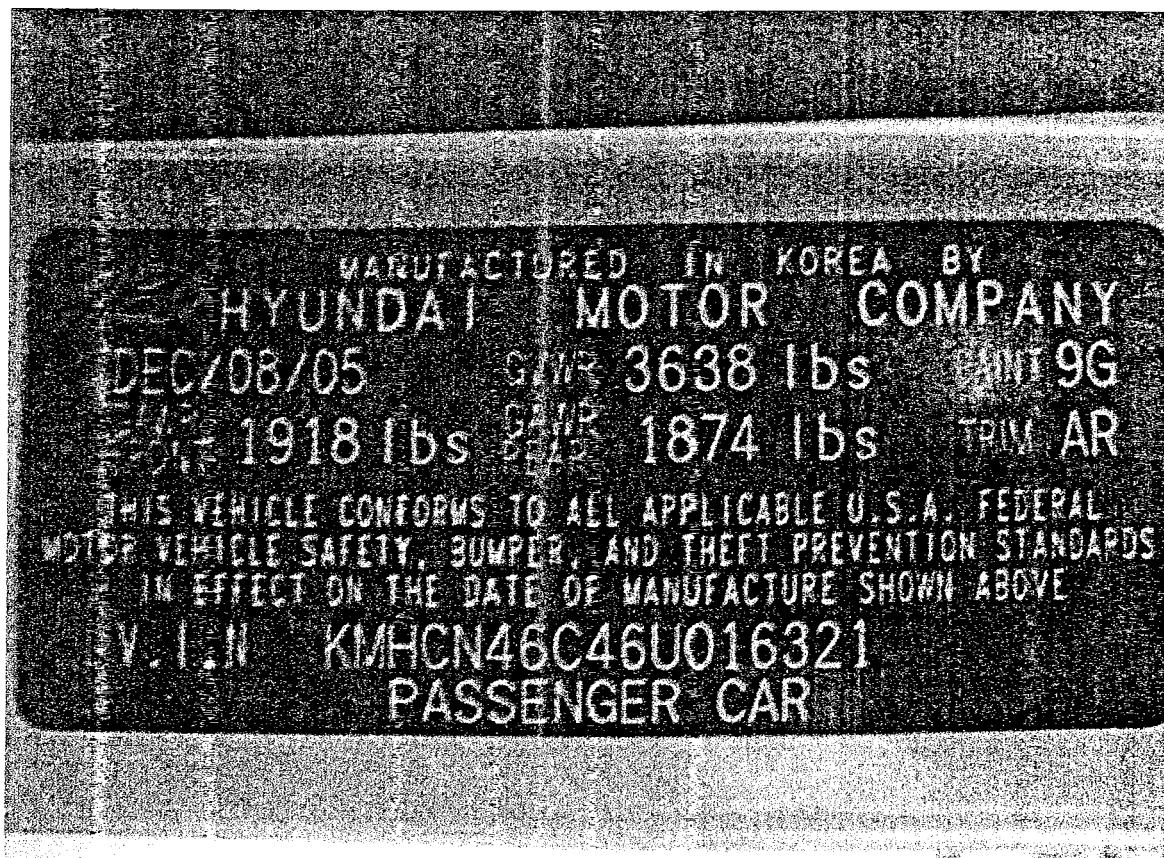
SEATING CAPACITY	TOTAL 5	FRONT 2	REAR 3
NOMBRE DE SIÈGES	TOTAL 5	AVANT 2	ARRIÈRE 3

The combined weight of occupants and cargo should never exceed 3000 lb or 1360 kg.
Le poids combiné des occupants et du chargement ne doit jamais excéder 1360 kg ou 3000 lb.

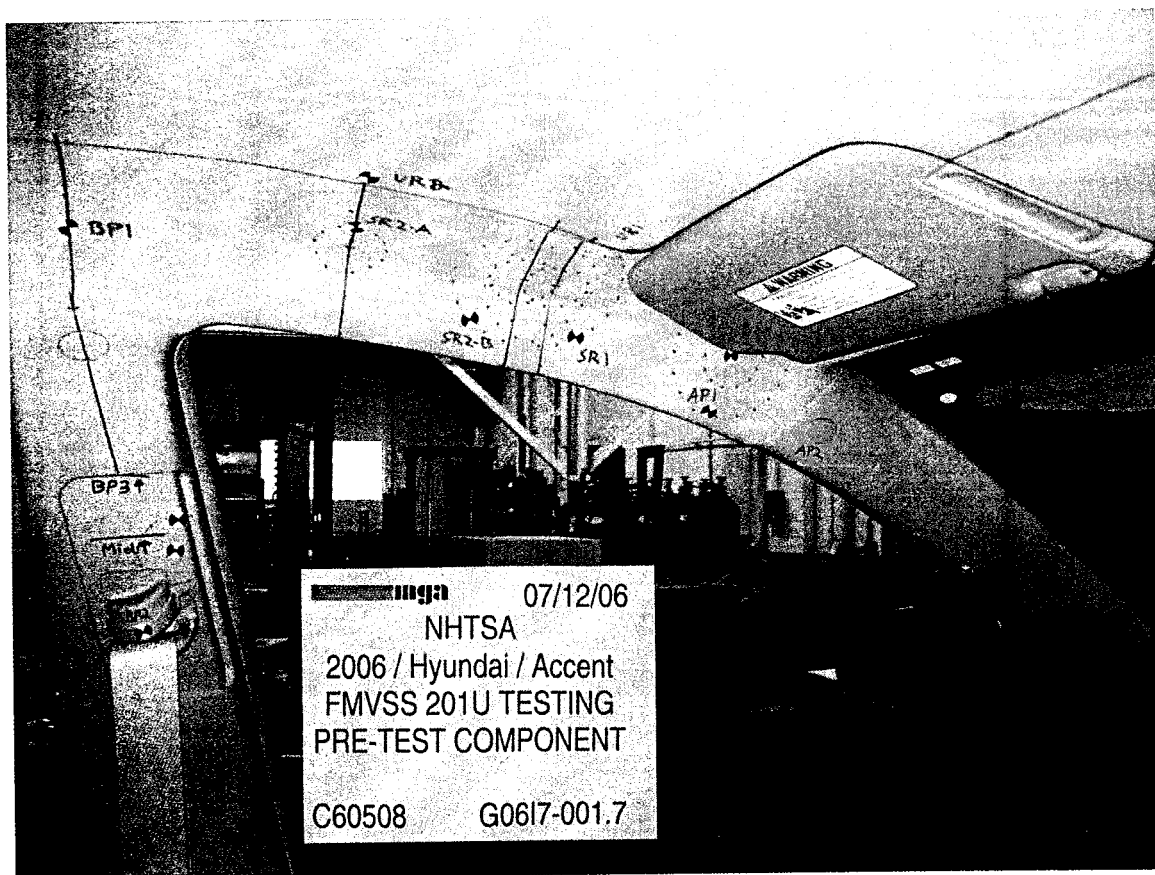
TIRE / PNEU	SIZE / DIMENSION	COLD TIRE PRESSURE / PRESSION À FROID
FRONT / AVANT	P185/65R14	210kPa, 30PSI
REAR / ARRIÈRE	P185/65R14	210kPa, 30PSI
SPARE / SECOURS	T115/70D15	420kPa, 60PSI

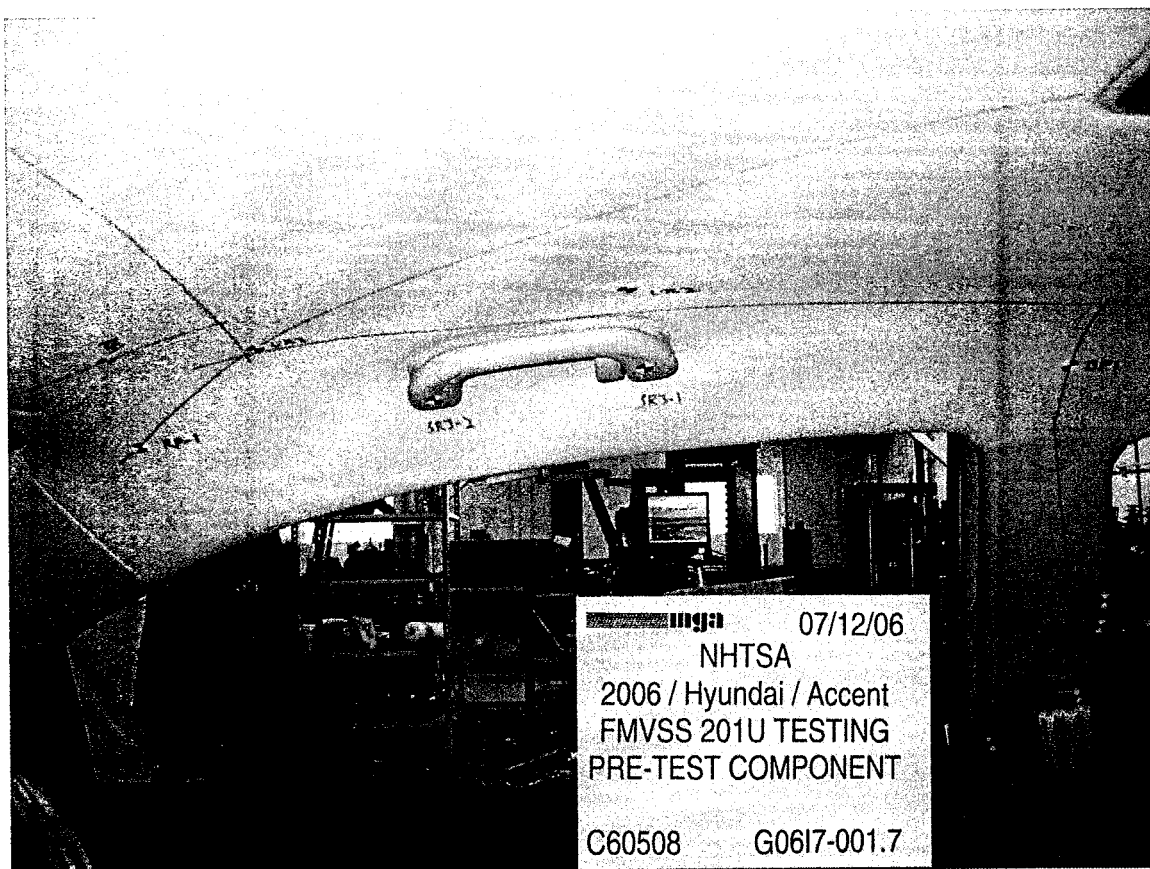
SEE OWNER'S MANUAL FOR
ADDITIONAL INFORMATION.
CONSULTER LE MANUEL
D'INFORMATION POUR
OBTENIR PLUS D'INFORMATIONS
DES RENSEIGNEMENTS
ADDITIONNELS.



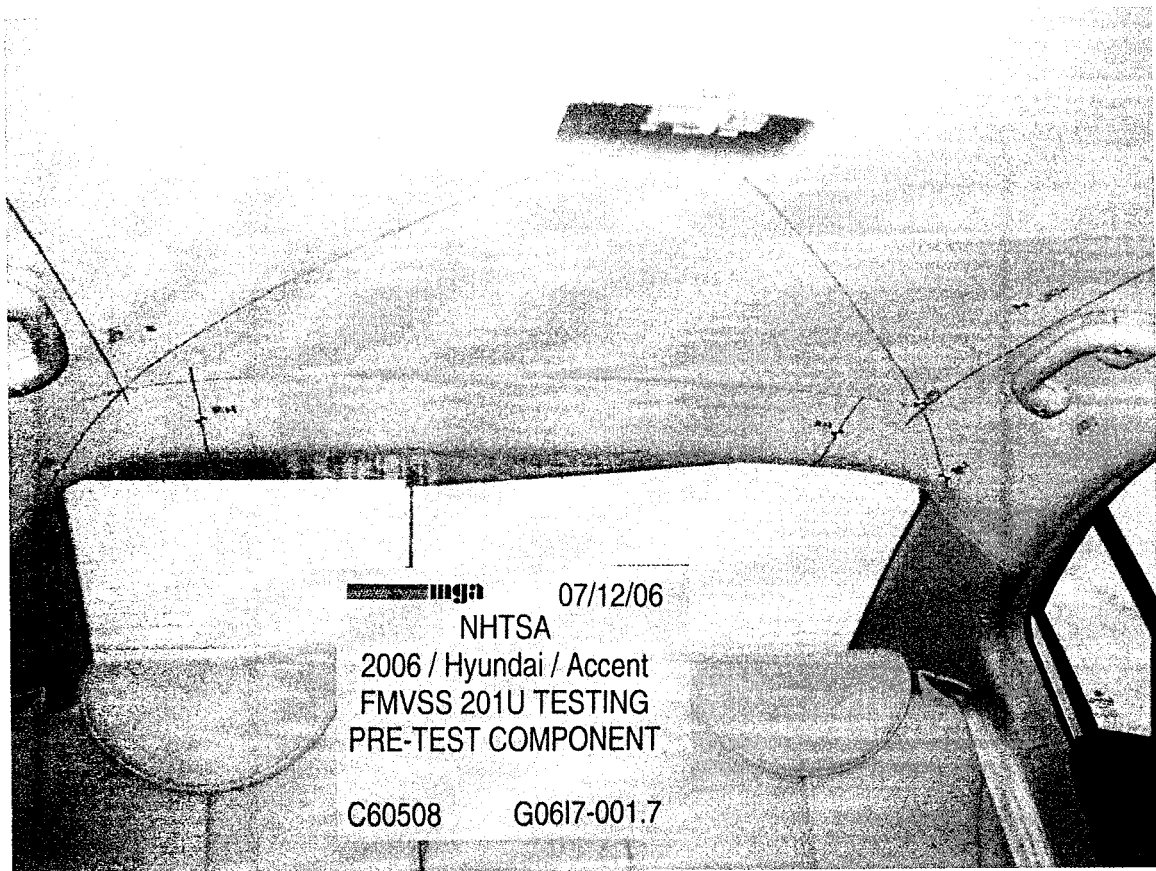








07/12/06
NHTSA
2006 / Hyundai / Accent
FMVSS 201U TESTING
PRE-TEST COMPONENT
C60508 G06I7-001.7

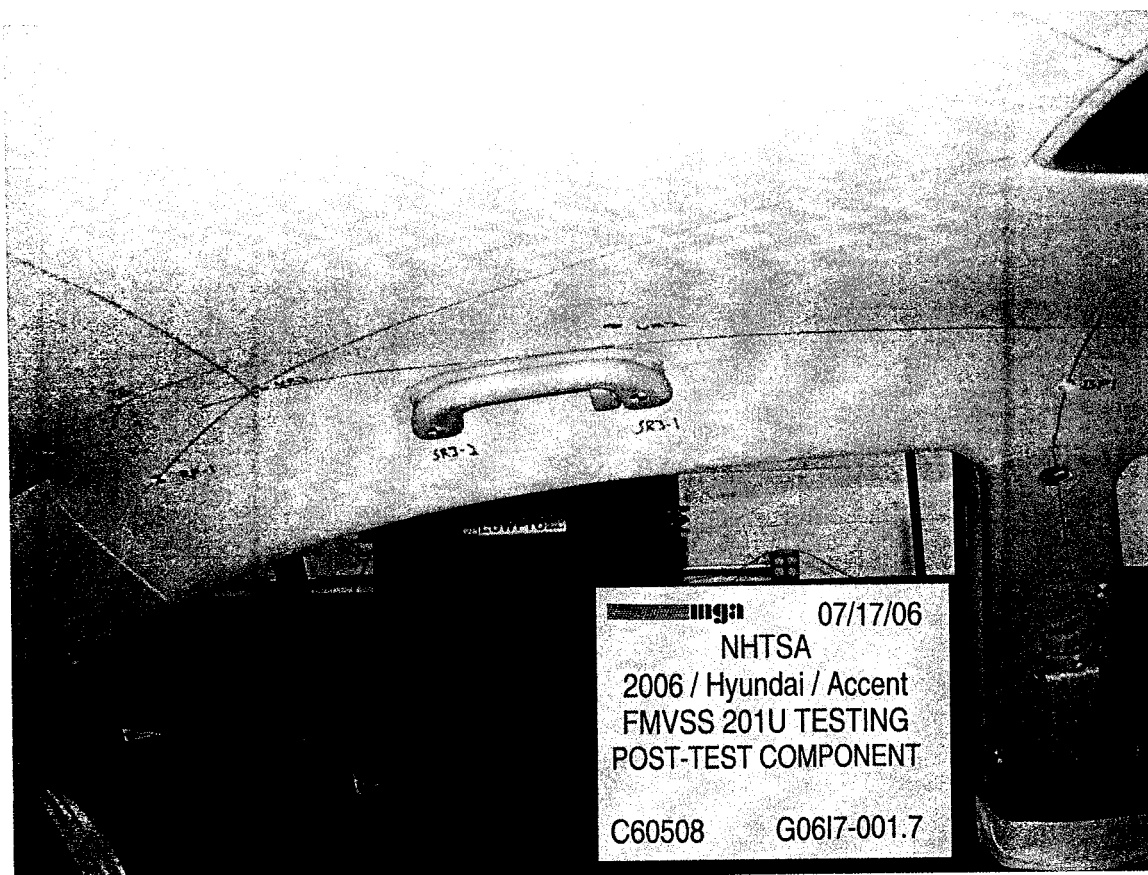


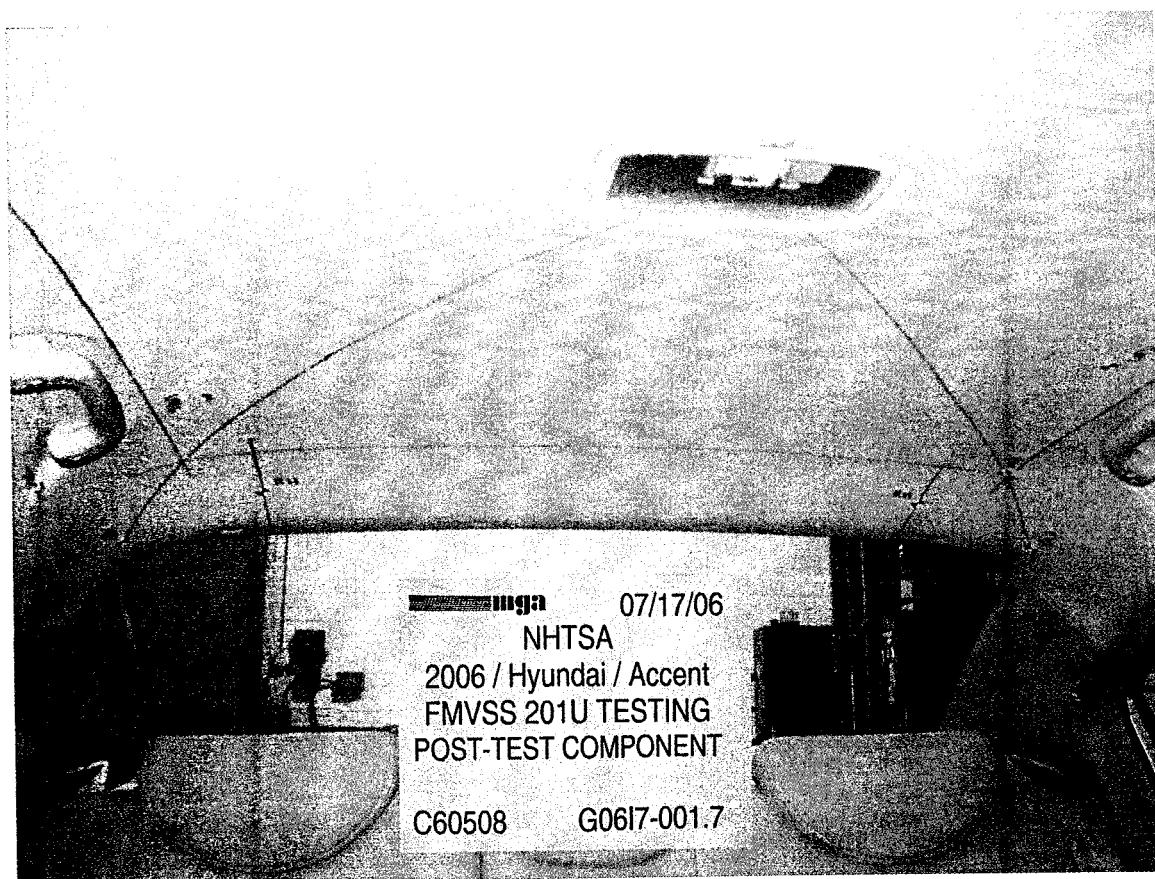


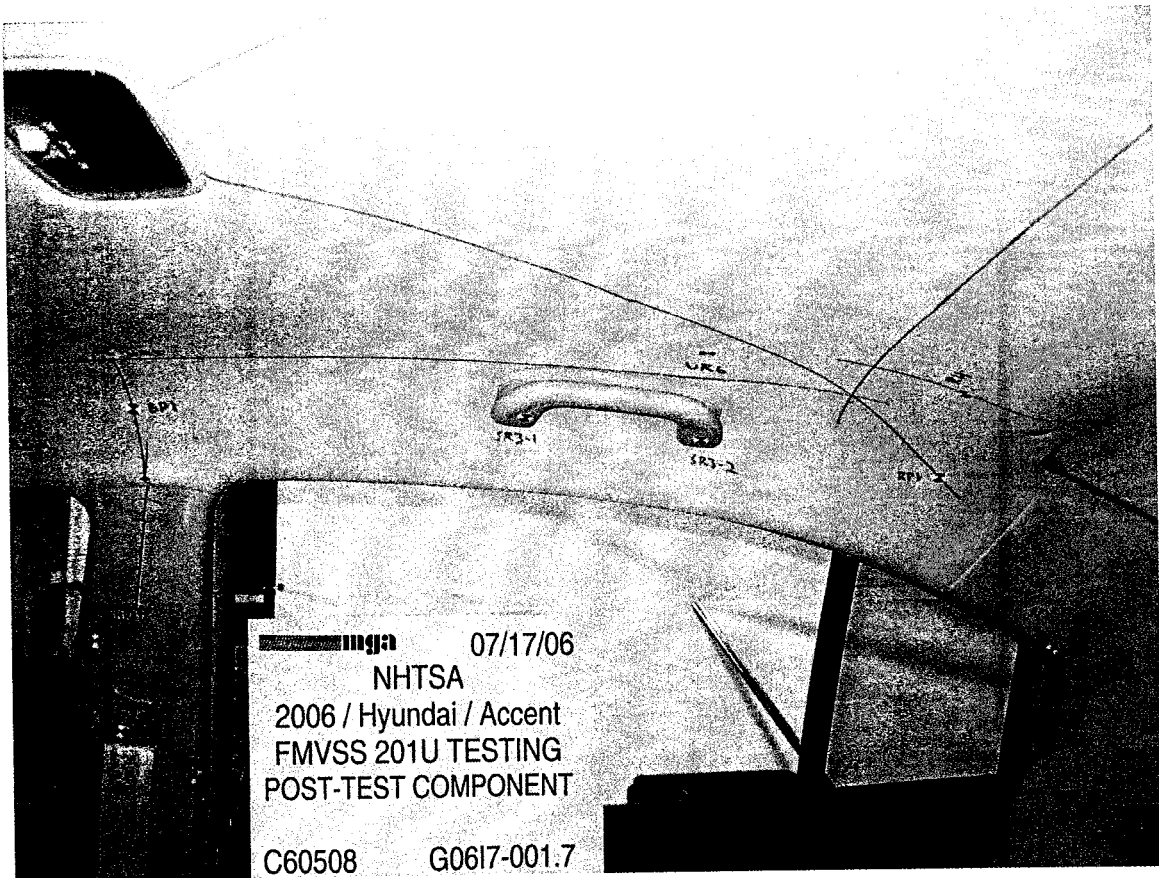


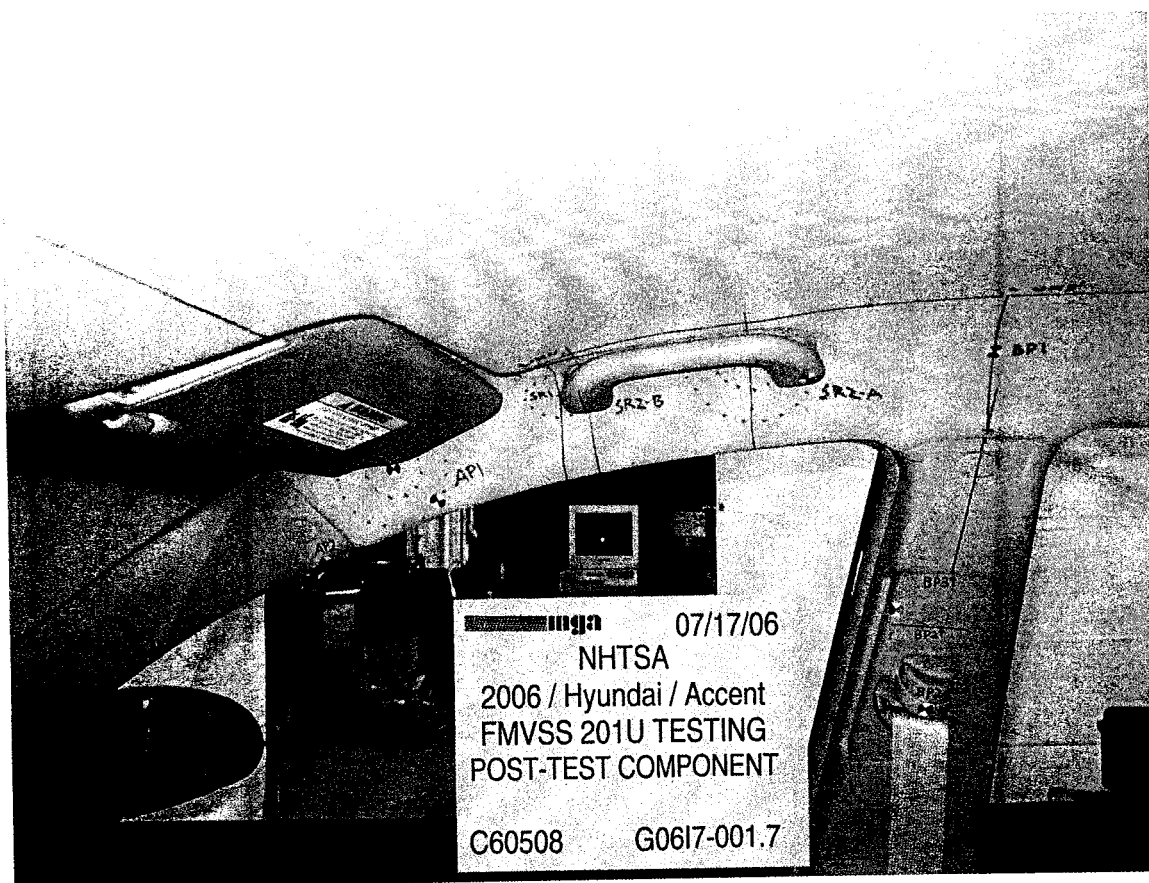




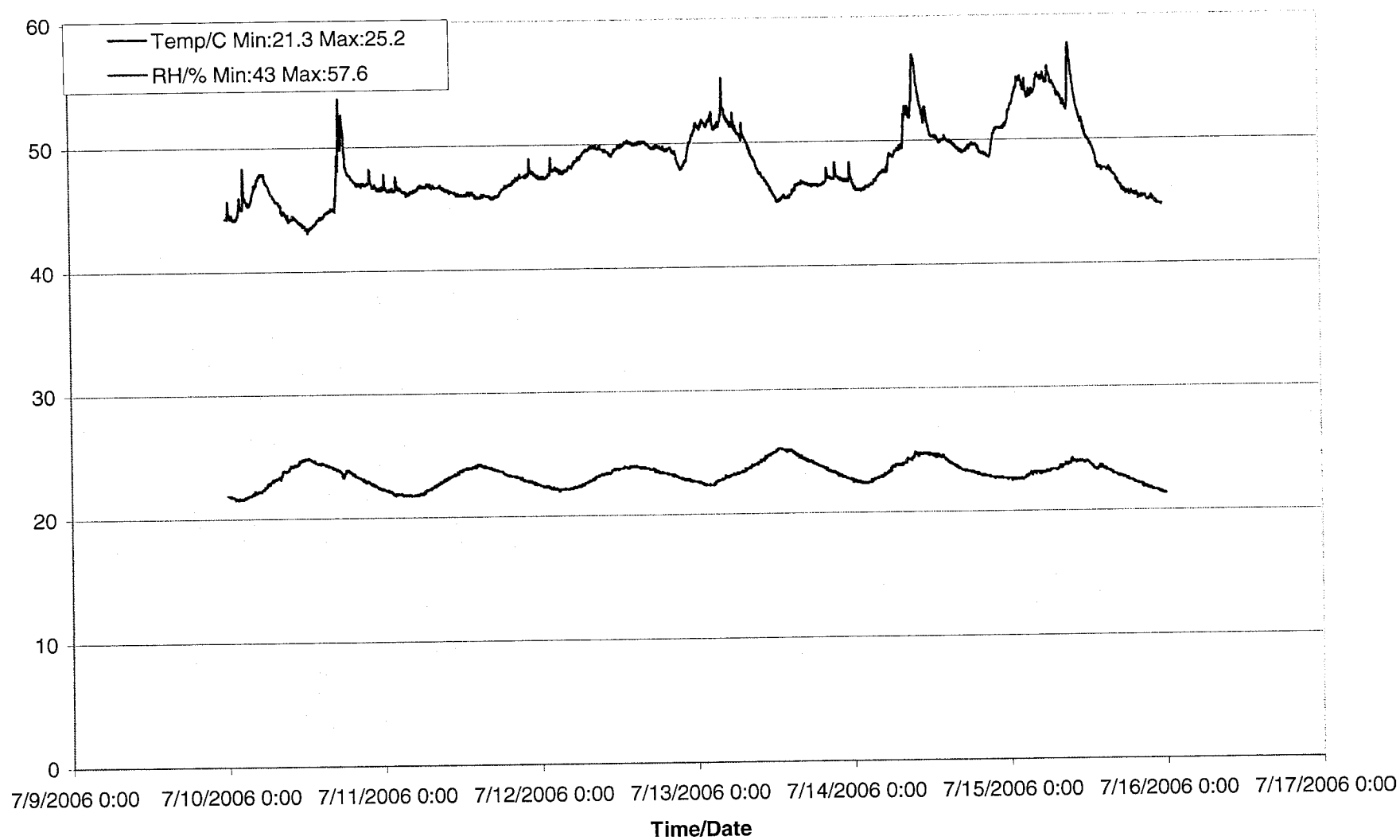








C60508 Hyundai Accent NHTSA 201U July 10-16 Temperature Trace





mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J35924	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/06/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0602

New DLR (100k , Units:G): 91.4

StdDeviation (%) 0.333

% Difference in DLR (New vs. Old): -0.253

Temperature (°F): 74

Humidity (%): 34

Performed By:

Matt Kerr

Approved By:

Deena A. Kalito

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J35919	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/06/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0602

New DLR (100k , Units:G): 94.4

StdDeviation (%) 0.447

% Difference in DLR (New vs. Old): -0.659

Temperature (°F): 74

Humidity (%): 34

Performed By: *Matt Kerr*

Approved By: *Donald A. Kalito*

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J22664	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/06/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0602

New DLR (100k , Units:G): 94.3

StdDeviation (%) 0.379

% Difference in DLR (New vs. Old): 1.167

Temperature (°F): 74

Humidity (%): 34

Performed By:

Matt Kerr

Approved By:

Donald A. Kalito

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J36197	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/07/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0604

New DLR (100k , Units:G): 108.8

StdDeviation (%) 0.008

% Difference in DLR (New vs. Old): -1.418

Temperature (°F): 72

Humidity (%): 38

Performed By: *Matt Kerr*

Approved By: *Donald Kalito*

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J36193	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/07/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0604

New DLR (100k , Units:G): 102.7

StdDeviation (%) 0.015

% Difference in DLR (New vs. Old): -1.848

Temperature (°F): 72

Humidity (%): 38

Performed By:

Matt Kerr

Approved By:

Deena A. Kalito

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J36353	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/07/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0604

New DLR (100k , Units:G): 97.2

StdDeviation (%) 0.003

% Difference in DLR (New vs. Old): -0.381

Temperature (°F): 72

Humidity (%): 38

Performed By:

Matt Kerr

Approved By:

Heena A. Kalito

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J13753	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/07/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0603

New DLR (100k , Units:G): 103.6

StdDeviation (%) 0.411

% Difference in DLR (New vs. Old): .013

Temperature (°F): 72

Humidity (%): 38

Performed By:

Matt Kerr

Approved By:

Deena A. Kalito

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: 301M09/484B
S/N: J22700	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 04/07/2006	Calibration Date: 06/13/2005
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0603

New DLR (100k , Units:G): 94.4

StdDeviation (%) 0.342

% Difference in DLR (New vs. Old): -1.008

Temperature (°F): 72

Humidity (%): 38

Performed By: *Matt Kerr*

Approved By: *Deena A. Kalito*

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7264-2000	Model: <i>301M09/484B</i>
S/N: J32734	S/N: <i>862/247</i>
Capacity: 2000 G	Capacity: <i>170 G</i>
Calibration Date: 04/07/2006	Calibration Date: <i>06/13/2005</i>
	Calibrated By: <i>Chuck DiMaggio/PCB Piezotronics, Inc.</i>

Test Reference Number: A0603

New DLR (100k , Units:G): 95.5

StdDeviation (%) 0.25

% Difference in DLR (New vs. Old): 1.345

Temperature (°F): 72

Humidity (%): 38

Performed By:

Matt Kerr

Approved By:

Heena Kalita

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 4.1\%$. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

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Interim Certification Document

Part Description: Silver Certification Date: 05/15/06 Serial#: S08-06-98-01273
 Single Point 2 Sigma: S08-05 +/- 0.75mm (+/- 0.030") Certified#: S0127338883
 Linear Displacement 2 Sigma: S08-05 +/- 1.08mm (+/- 0.042") Ambient Temperature: 22°C +/- 3°C

Measurement Standards Traceability

Ball Bar Kit Asset Number: 606 Calibration Date: 05/25/06 *SI Traceability: NPL-LL01010501
 10mm Step Gauge, Mitutoyo Asset Number: 773 Calibration Date: 04/03/06 *SI Traceability: NIST-821267216-02
 Code No.: 515-744 Calibration Date: 04/03/06 *SI Traceability: UKAS-174978
 Measuring range: 1.5m

*The artifact above has been calibrated with a device traceable to the International System of Units (SI) through a National Metrological Institute (NMI) or through an ISO 17025 Accredited Laboratory. Expanded measurement uncertainty is 3.9
 * 63X micrometers, where X represents value in inches. Uncertainty is expressed at approximately the 95% Level of Confidence using k=2.00.

Certification Results

A basic four quadrant certification included with all FARO Arms and comprised of: 2 vertical level single point repeatability test in
 4 quadrants with 5 repeats from 4 directions
 Step Gauge Test in 4 quadrants: 3 orientations per quadrant
 3 Length, 3 position free ball bar test in 4 quadrants

Calibration and certification conforms to procedures developed in accordance with ASME B89.4.22-200X.

Instrument condition as received

Inoperative

Instrument condition outgoing

Within specifications

Technician: Harry Van Horn Date: 05/06

FARO Technologies, Inc.
 PH1: 1-800-736-2771
 PH2: 407-333-9911
 FAX: 407-333-8056

125 Technology Park
 Lake Mary, FL 32746
 USA

FARO

**LABORATORY
 ACCREDITATION
 BUREAU**
 ISO/IEC 17025 Accredited

MICHIGAN OPERATIONS
DATE: 2/7/04
SUPERCEDES: MGATPTMC.5

DOC. NO.: MGATPTMC
REVISION NO.: 6
PAGE 3 OF 3

Tape Measure Calibration Certificate

Reference Steel Rule

Brand: GEI SYRACUSE
S/N: M6A00067
Calibration Date: 8-30-06

Subject Tape Measure

Brand: STANLEY
S/N: 675
Calibration Date: 4-25-06

Reference in (mm)	Subject Tape Measure	Difference	Reference in (mm)	Subject Tape Measure	Difference
0 (0)	0	0	18 (450)	450	0
1 (25)	25	0	19 (475)	475	0
2 (50)	50	0	20 (500)	500	0
3 (75)	75	0	21 (525)	525	0
4 (100)	100	0	22 (550)	550	0
5 (125)	125	0	23 (575)	575	0
6 (150)	150	0	24 (600)	600	0
7 (175)	175	0	25 (625)	625	0
8 (200)	200	0	26 (650)	650	0
9 (225)	225	0	27 (675)	675	0
10 (250)	250	0	28 (700)	700	0
11 (275)	275	0	29 (725)	725	0
12 (300)	300	0	30 (750)	750	0
13 (325)	325	0	31 (775)	775	0
14 (350)	350	0	32 (800)	800	0
15 (375)	375	0	33 (825)	825	0
16 (400)	400	0	34 (850)	850	0
17 (425)	425	0	35 (875)	875	0

If all differences are $\pm 1/32$ of an inch (1 mm), then the tape measure is acceptable.

Pass X

Fail

Maximum Difference = 0

Date: 4-25-06

Performed By: RJ Mill

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is $\pm 0.2\%$.
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor $k=2$.

5/1/06



4700 Barden Court S.E. • Kentwood, MI 49512 • Telephone: 616.698.3124 • Fax: 616.698.2364

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48063

Order Number: 45962
Report Number: 050829307
Page: 1 of 1

Gauge Number: MGA00048
Gauge Desc: Digital Protractor
Manufacturer: N/A
Model Number: Pro 380
Serial Number: N/A

Customer PO: 07-05-0820
Last Calibration: 8/23/04
Calibration Date: 8/29/05
Next Calibration: 8/29/06

As Found Condition: In Tolerance

As Left Condition: In Tolerance

MetroCal Inc. maintains reference standards of measurement which are traceable to the National Institute of Standards and Technology, or other authorized National Standards. Calibration was performed in accordance with MetroCal Proc. No. CP045 and complies with the ANSI/NCSS Z540-1 and ISO/IEC 17025 Standards. Results shall not be reproduced except in full without the written approval of MetroCal, Inc. Results relate only to the item(s) calibrated. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired. Statements of compliance made using simple acceptance rule.

Calibration Procedure
Uncertainty Expressed at
95% confidence (K=2)
(0.6R + 2L) microinches

Standard Used
Gage Blk Set ID# 105
DoAll Sine Bar ID#1879

Cal Date
6/6/05
12/8/04

Due Date
6/6/06
12/6/05

Traceable No.
821/270003-04
821/270003-04 & 3600042619

Results:

Units	As Found Readings		
	Nominal	Actual	Deviation
Decimal Deg.	5.00	5.0	0.00
	10.00	10.1	0.10
	20.00	20.1	0.10
	30.00	30.1	0.10
	40.00	40.1	0.10

Reference Level Check: Within +/- .1 degrees

As Left Readings		
Nominal	Actual	Deviation
5.00	5.0	0.00
10.00	10.1	0.10
20.00	20.1	0.10
30.00	30.1	0.10
40.00	40.1	0.10

Reference Level Check: Within +/- .1 degrees

Comments: Environmental conditions during calibration: 68 deg. F., 41 % RH.

Jamie Nikolich
Jamie Nikolich
Calibration Technician

Issued: 8/29/05

☐ Checked box indicate this calibration was performed at the customers facility.

9/4 8/31/05

Form: F410/12-3 Revision Date 03-11-03
 Revision Level: E
 STANDARD FORM

20950 Boening St.
 Southfield Mi. 48075
 Phone (248) 358-0590 Fax (248) 355-2529

Sterling Scale Company Inc. Scale Certificate of Calibration

Customer: MGA RESEARCH
 Location of Calibration: 446 EXECUTIVE DRIVE
TROY, MI. 48083
 Certification Number: 8111
 Date of Calibration: 7-20-05
 **Next Calibration Due: 7-06
 Environmental Condition: ☒ Good ☐ Fair ☐ Poor

Make:	Model:	Serial/ID#:	Capacity:
SW SCALES	SW DELUXE	26032389	8800 x 1 lb

This certifies that the above scale has been calibrated using the relevant EPO, original equipment manufacturer calibration procedures along with Handbook 44 tolerances using weights traceable to the National Institute of Standards and Technology as well as the International Systems of Units (SI).

Sterling Scale Weight/Weight kit serial #: 1216, 1218, 1221, 1226, 50967, 10002

Calibrated to class: III

Date Weight/Weight kit calibrated: 7/6/04 9/03

Date Weight/Weight kit due: 7/06 9/05

Expanded Uncertainty (k=2) confidence level of 95% is reported with the before and after readings on next page.

Temperature 69 Humidity 42%

Pg 1 of 3

These items relate only to these results

Tolerances followed are maintenance/acceptance per HB-44

This report shall not be reproduced, except in full, without written approval of the laboratory.

** Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

The reported uncertainty is valid only for the environment in which it is determined.



7/20/05

1448.01

Form: F410/12-3 Revision Date 03-11-03
 Revision Level: E
 STANDARD FORM

20950 Boening St.
 Southfield Mi.48075
 Phone (248) 358-0590 Fax (248) 358-0590

Sterling Scale Company Inc.
Scale Certificate of Calibration

Applied Test Weight	Before Adjustment	Tolerance +/-	in tolerance Y / N	After Adjustment	in tolerance Y / N	expanded uncertainty
LF 50 ^{lb}	50 ^{lb}	1 ^{lb}	Y	50 ^{lb}	Y	.003
1000 ^{lb}	1000 ^{lb}	2 ^{lb}	Y	1000 ^{lb}	Y	.06
2200 ^{lb}	2200 ^{lb}	2 ^{lb}	Y	2200 ^{lb}	Y	.13
LA 2 50 ^{lb}	50 ^{lb}	1 ^{lb}	Y	50 ^{lb}	Y	.003
1000 ^{lb}	1000 ^{lb}	2 ^{lb}	Y	1000 ^{lb}	Y	.06
2200 ^{lb}	2200 ^{lb}	2 ^{lb}	Y	2200 ^{lb}	Y	.13

Shift test.

1	2
3	4

N/A SMALL PAD

	1	2	3	4
Before Adj.				
After Adj.				

Scale condition as found:

GOOD

Tests performed: ☒ Repeatability ☒ Linearity ☐ Sensitivity ☒ Discrimination

☒ Scale Certified

☐ Scale Rejected

If scale is rejected, why?

GARY
 Sterling Scale Service Rep.

Date: 7-20-05

pg 2 of 3

These items relate only to these results.

This report shall not be reproduced, except in full, without written approval of the laboratory.
 Tolerances followed are maintenance/acceptance per HB-44

** Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.



1448.01

Form: F410/12-3 Revision Date 03-11-03
 Revision Level: E
 STANDARD FORM

20950 Boening St.
 Southfield Mi. 48075
 Phone (248) 358-0590 Fax (248) 358-0590

Sterling Scale Company Inc.
Scale Certificate of Calibration

	Applied Test Weight	Before Adjustment	Tolerance +/-	In tolerance Y / N	After Adjustment	In tolerance Y / N	expanded uncertainty
RR(3)	50 ^{lb}	50 ^{lb}	1 ^{lb}	Y	50 ^{lb}	Y	.003
	1000 ^{lb}	1000 ^{lb}	2 ^{lb}	Y	1000 ^{lb}	Y	.06
	2200 ^{lb}	2200 ^{lb}	2 ^{lb}	Y	2200 ^{lb}	Y	.13
RR(4)	50 ^{lb}	50 ^{lb}	1 ^{lb}	Y	50 ^{lb}	Y	.003
	1000 ^{lb}	1000 ^{lb}	2 ^{lb}	Y	1000 ^{lb}	Y	.06
	2200 ^{lb}	2200 ^{lb}	2 ^{lb}	Y	2200 ^{lb}	Y	.13

Shift test.

	2
1	3
	4

N/A SMALL PADS

	1	2	3	4
Before Adj.				
After Adj.				

Scale condition as found: GOOD

Tests performed: ☒ Repeatability ☒ Linearity ☐ Sensitivity ☒ Discrimination

☒ Scale Certified

☐ Scale Rejected

If scale is rejected, why?

GARY
 Sterling Scale Service Rep.

Date: 7-20-05

pg 3 of 3

These items relate only to these results.

This report shall not be reproduced, except in full, without written approval of the laboratory.

Tolerances followed are maintenance/acceptance per HB-44

** Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.



1448.01

Certificate Number: 20053372Cal



Detroit Testing Laboratory, Inc.



Certificate No. 20.45

7111 E. 11 Mile Road, Warren, MI 48092-2709 • (586) 754-8000 • FAX (586) 754-8045 • www.dtl-inc.com

Certificate of Calibration

Equipment Information

Customer:	MGA Research Corporation 446 Executive Drive Troy, MI 48063	Model:	EP4102C
		Serial Number:	12641125353320P
		Manufacturer:	Ohaus
		Description:	Balance
System ID:	MGA00133	DTL Job No.:	5106038
Customer Asset:		Cust PO No.:	7-05-1197

Calibration Information

Calibration Date:	11/9/2005	Procedure:	33K6-4-72-1/98
Due Date:	11/9/2006	Tolerance:	MFR SPEC
Calibration Interval:	12 Month		
Condition Received:	Pass	Temperature:	24 °C
Condition Returned:	Pass	Humidity:	43 % RH
Calibration Limitation:			
Performed On Site:	Yes		

The uncertainty of measurement pertaining to these measurements is estimated to be 6mg ± 0.01% Ind based upon an approximate 95 % confidence level at k = 2.

Pass/Fail statements represented are based on data from measurements documented at the time they were made, procedure utilized, professional experience, and associated uncertainty. It is ultimately up to the user of this equipment to determine if this item meets their specific requirements for accuracy for its intended application.

Any calibration interval and due date, if stated, is at the request of the customer. Due to the fact that many variables may effect drift or shift in reported values over time there is no assurance implied that this item will maintain specified accuracies throughout timeframe stated.

Calibration Standards Used Information

<u>Standard Name</u>	<u>System ID</u>	<u>Due Date</u>	<u>Last Action Date</u>
09913, Weight Set, Denver 5kg - 1kg Cla	09913	08/29/2006	08/29/2004
04970, Weight Set, 500g-1mg	04970	02/29/2008	02/08/2006
11197, Temp/RH Indicator Exttech 446580	11197	02/15/2006	02/15/2005

This calibration has been performed and reported in accordance with ISO 17025:2005. Reported results are from standards traceable to NIST, or another NMI to the International System of Units (SI), derived from physical constants, ratio measurements, national measurements standards, or comparison to consensus standards. Value reported apply only to equipment listed. This certificate may not be reproduced, except in its entirety, without written approval of Detroit Testing Laboratory, Inc. Detroit Testing Laboratory Terms and Conditions apply.

Signature: <u>Jerry Wells</u>	Date: <u>2-20-06</u>	Approved: <u>Paul W.</u>	Date: <u>2-20-06</u>
Jerry Wells, Technician			

Date/Time Printed: 2/20/2006

Page 1 of 2

Printed By: QCF 1048-1 Rev 12/31/05

2/20/06

Detroit Testing Laboratory, Inc.

CALIBRATION DATA SHEET

Date: 11/9/05
 DTL ID: MGA00133
 Cert. No. 20053372Cal

Cal Point grams std	Reading as Found grams out	Reading as Left grams out	Deviation as Found grams	Deviation as Left grams	% of Allowable Dev as Found	% of Allowable Dev as Left
0.100	0.10	0.10	0.00	0.00	0.0	0.0
1.000	1.00	1.00	0.00	0.00	0.0	0.0
100.000	100.00	100.00	0.00	0.00	0.0	0.0
1000.00	1000.00	1000.00	0.00	0.00	0.0	0.0
2000.00	2000.01	2000.01	0.01	0.01	33.3	33.3
3000.00	3000.01	3000.01	0.01	0.01	33.3	33.3
4000.00	4000.01	4000.01	0.01	0.01	33.3	33.3



4700 Barden Court S.E. • Kentwood, MI 49512 • Telephone: 616.698.3124 • Fax: 616.698.2364

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48063

Order Number: 47706
Report Number: 060118708
Page: 1 of 1

Gauge Number: MGA00146
Gauge Desc: Digital Temperature - Humidity Gage
Manufacturer: Dickson
Model Number: TM325
Serial Number: 0406553

Customer PO: N/A
Last Calibration: 1/14/05
Calibration Date: 1/18/06
Next Calibration: 1/18/07

As Found Condition: In Tolerance

As Left Condition: In Tolerance

MetroCal Inc maintains reference standards of measurement which are traceable to the National Institute of Standards and Technology or natural physical constants (Lithium Chloride and Sodium Chloride for humidity). Calibration was performed in accordance with MetroCal procedure # CP048 and complies with the ISO/IEC 17025 and ANSI/NCSL Z540-1 Standards. Results shall not be reproduced except in full without the written approval of MetroCal, Inc. Results relate only to the item(s) calibrated. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired. Statements of compliance made using simple acceptance rule.

Standard Used
Vaisala Temperature and
Humidity Meter ID#13337

Cal. Date
9/29/05

Due Date
9/29/06

Traceable No.
Cert. No.4677494-90-1-1

Calibration Procedure
Uncertainty expressed at
95% confidence (K=2)
Temp. $\pm 0.75^{\circ}\text{F}$.
Humidity $\pm 2.3\%$ R.H.

Results:

	As Found Readings			As Left Readings		
	Standard	Actual	Error	Standard	Actual	Error
Temperature						
Tolerance	68.2	68.4	0.2	35.0	35.0	0.0
Temp: $\pm 1.8^{\circ}\text{F}$	72.6	72.8	0.2	68.0	69.0	1.0
Hum: $\pm 5\%$ RH						
Percent of Relative Humidity						
Temp. Units						
$^{\circ}\text{F}$						
	Standard	Actual	Error	Standard	Actual	Error
	11.3	15.9	4.6	11.3	15.9	4.6
	33.7	37.6	3.9	33.7	37.6	3.9
	73.0	73.8	0.8	73.0	73.8	0.8

Comments: Environmental Conditions During Test: 68° F, 42% RH
No adjustments required. Tolerance supplied by customer.

Bill Rinze issued: 1-15-06
Bill Rinze
Calibration Technician

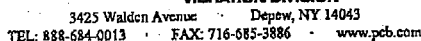
☐ Checked box indicate this calibration was performed at the customers facility.

2/22/06

Per ISO 16083-21

Manufacturer: PCB

PAGE 1 of 1



~Certificate of Calibration~

Model Number: 484B

Serial Number: 2470

Description: Signal Conditioner

Test Procedure: AT-106-1

Temperature: 70° F

N.I.S.T. Project #: F2565002/5UU2VF-2-
1/81000539626720012

Calibration Date: 6/15/2005

Recalibration Date:

Calibration Technician: James Higbee 2b

Relative Humidity: 54%

Volts	Current (mA)	Gain*
24.0	3.85	1.000

As Received: In tolerance, no adjustment required.

As Left: In tolerance.

Special Notes:

This document certifies that the equipment referenced above meets published specifications. The calibration procedure is in compliance with ISO 10012-1, and former MIL-STD-45662A and is traceable to NIST. *Measurement uncertainty (95% confidence level w/coverage factor of 2) for scale factors is +/- 0.2%.

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PCB Piezotronics, Inc.



PCB PIEZOTRONICS™

3425 Walden Avenue Depew, New York, USA 14043-2495

For any questions concerning this certificate, please call PCB at (716) 684-0001 and ask for an application engineer.